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ABSTRACT

Presented is an issue-oriented approach for incorporating regional environmental planning concepts into existing secondary school curricula. Part I describes the use of an issue-oriented approach to teaching regional planning. Models for analyzing an issue are presented. Two sample units are included. Part II presents a summary of environmental planning legislation on the federal, state, regional, and local level. A detailed list of information sources is provided. Part III contains a discussion and illustration of the development of an urban study unit as a means of increasing students' sensitivity to various aspects of their environment. (Author/RE)

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A SUPPLEMENT TO . . .

A GUIDE FOR TEACHING REGIONAL ENVIRONMENTAL PLANNING

ED180774

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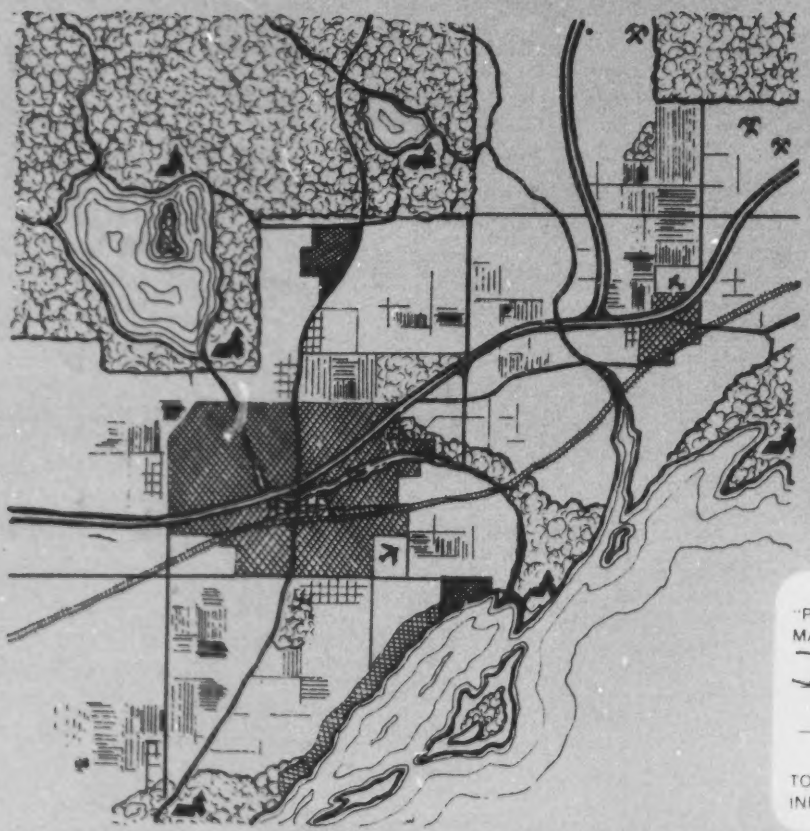

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A SUPPLEMENT TO A GUIDE FOR TEACHING REGIONAL ENVIRONMENTAL PLANNING

Resource Material Development Project:
Supplemental Materials for Teaching Regional
Environmental Planning in Secondary Schools

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July 1979

WHY SHOULD WE TEACH REGIONAL ENVIRONMENTAL PLANNING?

In the past ten years, there has been a tremendous increase in public awareness and concern regarding the quality of the environment. Much of this attention, however, has focused on the immediate solution of new or existing environmental problems. There exists an urgent need for citizens to become aware of the value of long term strategies such as regional environmental planning, which not only formulate solutions to current environmental problems, but also provide a means of effectively organizing community growth and development so that new environmental problems are not created.

A primary function of the secondary school system is to prepare students to assume roles as active, effective citizens. Incorporating the study of regional environmental planning into the existing secondary school curriculum will provide students with the background necessary to appreciate the planning process and its effect on existing government structure. It will also develop an appreciation of the value of regional environmental planning as a strategy for maintaining the quality of the environment. As a result, students will be better able to make decisions regarding the increasingly complex environmental issues facing our society.

INTRODUCTION

A Guide For Teaching Regional Environmental Planning was developed to provide teachers with some background information regarding regional environmental planning, some sources of additional information, and suggestions for incorporating regional environmental planning activities into existing courses.

This Supplement to A Guide for Teaching Regional Environmental Planning presents an issue-oriented approach for incorporating regional environmental planning concepts into existing secondary school curricula.

Part I describes the use of an issue-oriented approach to teaching regional environmental planning. Models for analyzing an issue are presented and discussed. Two sample units - one in the natural sciences and one in the social sciences - are also included.

Part II presents a summary of environmental planning legislation; a description of federal, state, regional, and local government involvement in environmental planning activities regarding land use, transportaion, water quality, air quality, and solid waste management; and a detailed summary of environmental planning information sources available to teachers.

Part III is a discussion and illustration of the development and use of Urban Trails as a means of increasing students sensitivity to the many different aspects of their environment.

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PART I
AN ISSUE-ORIENTED APPROACH

USING AN ISSUE TO INTRODUCE REGIONAL ENVIRONMENTAL PLANNING CONCEPTS

Local environmental issues can be used to integrate regional environmental planning concepts into a wide range of currently existing science and social science classes. By studying these issues and the processes used to resolve them, students examine applications both of the concepts developed in the course and the concept of regional environmental planning. In addition, examining the regional environmental planning process provides an opportunity to integrate concepts from several different subject areas.

If, for example, a community has a problem with contaminated water supplies, a chemistry class might examine the nature of the contaminant, the processes by which it was created and the technical processes that might be used to remove it from the water supply. Related discussions could include topics such as the origin of the problem and the effects that the contamination would have on the surrounding areas if allowed to continue. Regional environmental planning organizations could be introduced as part of a discussion of how standards for water quality are determined and monitored.

A social studies class might use the same water-contamination issue as the basis for a study of the economic factors which contributed to the origin of the problem, the costs involved in resolving it, and the effects that the contamination might have on local property values, businesses, and industries. Regional environmental planning could be introduced as a process which could effectively coordinate the economic impact of the contamination, develop strategies for resolving the issue, and plan future community development in a manner such that similar incidents would not occur.

Part I is devoted to the presentation of a general model for examining local environmental issues and an illustration of how the model can be applied to a local solid waste issue. Two sample teaching units developed from this model conclude the section.

GENERAL MODEL OF AN ISSUE

Figure A presents a general model of how a local environmental issue might develop and how alternative solutions for the issue might be evaluated. The center column of the model illustrates the historical progression of the issue from "How The Issue Came About" at the top of the figure through "Community Response: Identify Alternatives" and "Evaluation of Alternatives" to "Proposed Action" and "Results." The columns on the left and right of the figure present scientific/technological factors and social factors that contribute to each part of the issue. For instance, in considering "How the Issue Came About" one must identify both "man's interference in the functions of natural systems" (e.g. ecological, biological, chemical, physical) and the "societal values," "legal controls" and "community needs" that have encouraged or permitted such interference. The "Science/Technology" and "Social Factors" columns help demonstrate the variety of inputs required from many different fields in order to perform a realistic analysis of how an issue has developed, what alternatives are available, which alternative action should be chosen and what effect that alternative will have on our physical environment and social institutions.

Using this general model to structure their approach to a local environmental issue, teachers should be able to identify aspects of the issue and of the planning process that can be presented as illustrations of important course concepts. The total model might also be used to structure the teacher's introduction or discussion of the environmental issue.

GENERAL MODEL

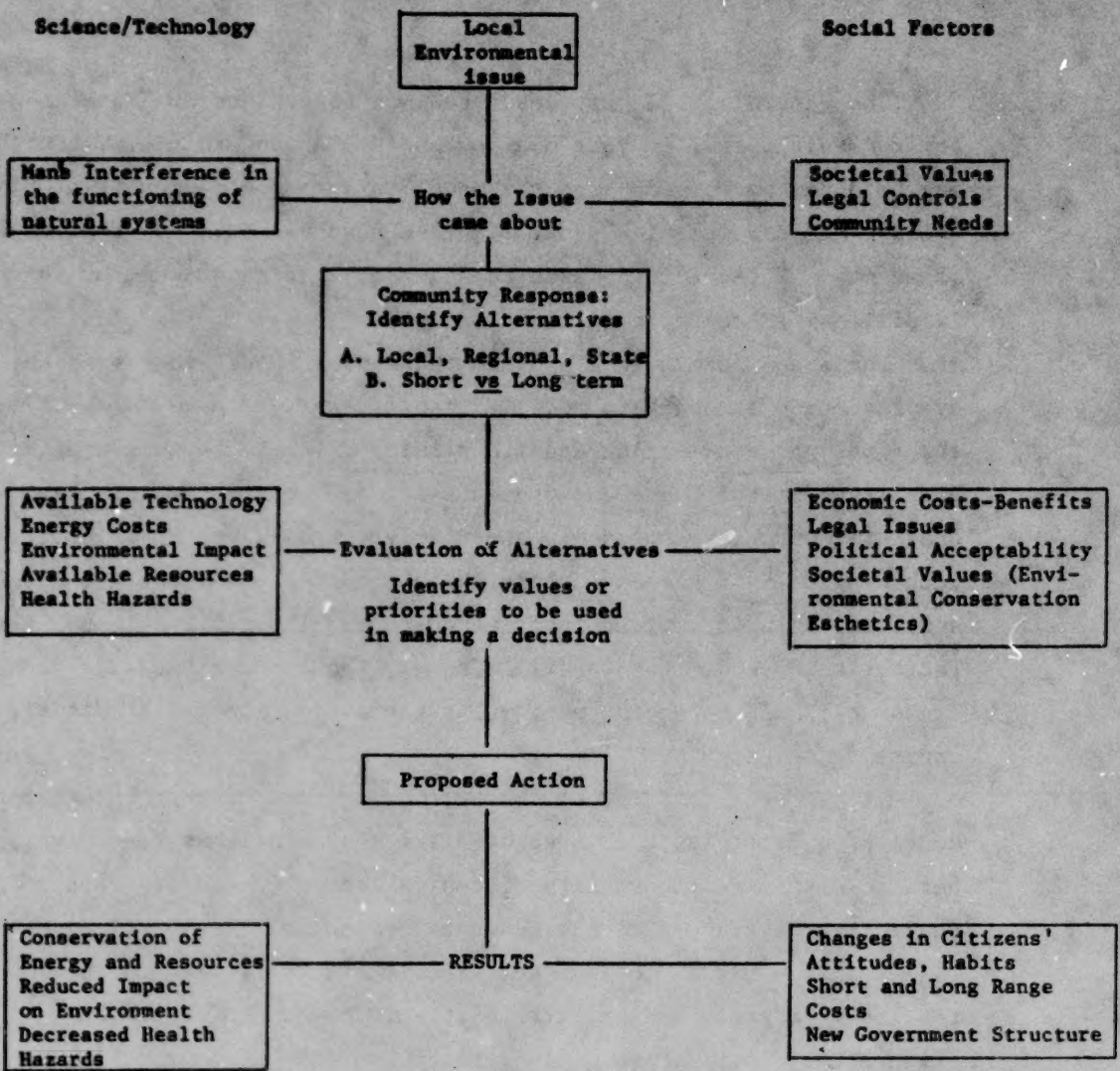


FIGURE A

3

A MODEL OF A LANDFILL ISSUE

The general model just described can be used to evaluate an environmental issue in your own community. As an example of how this may be done, we have applied the model to a common community problem - solid waste management - as it might be resolved by a hypothetical community. The specific issue raised is: What to do when present landfill sites begin to fill?

The model in Figure B applies the general model to this issue by presenting the background, the proposed alternatives, the evaluation, the final proposed action and its results. The Table following Figure B enlarges on the issue and presents in more detail how this hypothetical community approaches and resolves it. When the scientific, technological and social factors which comprise the issue are discussed, this table is divided into two columns. The right column lists factors relevant to the landfill issue. The left column lists subject areas which might use the particular factor to illustrate specific course concepts.

It is not necessary, of course, for any one teacher to develop a model of a local issue in such detail. The detail has been developed here to emphasize the variety of topics and subject areas related to environmental issues and environmental planning.

The wide variety of subject areas that are related to the issue results in a great deal of flexibility in the use of the model. Science and social science staff might develop a team teaching approach to the issue. Several teachers could also use the same issue to illustrate concepts in their different courses in order to demonstrate complex and interdisciplinary nature of environmental issues.

LAND FILL ISSUE

Local landfill sites are rapidly filling and will soon be unable to deal with the growing volume of solid waste.

SCIENCE/TECHNOLOGY

I-A

1. Regional Geology and Geography results in a limited number of appropriate landfill sites, most of which are already overused.
2. New resource recovery systems make complete landfilling a questionable practice.
3. Landfills are a possible health hazard to plants, animals, and people.

SOCIAL FACTORS

I-B

1. People's desire for convenient living.
2. People's desire for beautiful-healthy environment.
   State or local regulations regarding zoning and burning.
   Federal and state regulations regarding landfill specifications.
3. Community expectations for continued population growth.
   Community desire for continued industrial growth.
4. Increased public concern with conservation of resources.

HOW THE ISSUE CAME ABOUT

Community Response: Identify Alternatives

1. Continued landfill in less appropriate sites.
2. Resource recovery systems.
3. Alternate disposal systems: incinerate, slurry, ship out of locality (e.g. outer space), private dumps.
4. Reduce amount of garbage/person, limit community growth.

1. Is reliable technology available for resource recovery, energy recovery, long distance transportation, etc.?
2. How much and what types of energy will be required by each alternative?
3. Which alternative has the smallest negative impact on the local environment, (e.g. land, air, water)?
4. Which alternative makes the best use of local resources (land fill sites, transfer stations, incinerators, recoverable resources, transport systems)?
5. Does alternative pose possible health hazards (contamination of air, water, entry of hazardous materials into food chains)?

EVALUATION OF ALTERNATIVES

II-B

1. Does alternative meet federal and state regulations?
2. What are the capital expenditures and operating costs for each alternative?
3. Is federal or state support available (monetary, licensing, planning)?
4. Would regional operation be more efficient, effective? Will new government structures be required?
5. Does alternative coordinate with other land use plans?
6. What effect will it have on local employment, development, etc.?
7. How do local groups react to each alternative?
8. Will citizens accept required changes in lifestyle, habits?
9. Will it lead to long range savings or to increased costs? (i.e. for taxes, loss of resources, clean-up of pollution.)

PROPOSED ACTION

Integrated regional waste management program

III-A

1. Large scale resource recovery facilities efficiently retrieve significant amounts of reuseable materials and energy.
2. A single, appropriately located facility reduces environmental impact throughout the region. In addition, hazardous materials are concentrated in a single spot, where they can be disposed of more effectively, thereby reducing public health risks.
3. Regional operations increase technical flexibility to accommodate present and future needs.
4. Regional waste management facilities provide an appropriate setting for research and development of improved resource recovery methods.

RESULTS

III-B

1. Local communities establish a regional waste management authority.
2. Regional organization results in lower per capita costs. Reduced operating costs due to sale of recovered resources.
3. Federal or state support received for planning and building plant.
   Bond issue required to raise capital for plant.
4. Greater citizen awareness of garbage as a resource. Citizens cooperate in sorting their garbage.
5. Long term reduction in costs to environment. (i.e. clean up of pollution, production of recycled rather than new materials).
6. Regional plant can provide a focus for comprehensive community planning.

FIGURE B

TABLE FOR FIGURE B

I. HOW THE ISSUE CAME ABOUT

The city of Forsyte has a population of around 50,000 and is located in a rather densely populated area about 30 miles from a major metropolitan area. There are several other towns and suburban communities nearby. The open land surrounding Forsyte is prime farming land. The recent movement of light industry into the area indicates expanded community growth for Forsyte in the near future.

The present landfill used by Forsyte's Department of Sanitation had begun to fill up and the Forsyte city council asked a consulting firm to identify new landfill sites. The consulting firm report indicated few remaining landfill sites in the area. Of three sites that were identified two involved the use of prime farming land near already existing suburban developments and the third was not large enough to last more than seven years at the present filling rate. Nearby communities have indicated that they are confronted with similar problems regarding future landfills. Below is a description of the scientific and social factors relevant to the present dilemma.

Subject Areas	I-A. Science/Technological Factors
Earth Science Ecology Environmental Science General Science Geography Geology	1. Landfills The number and size of suitable landfill sites around Forsyte is limited by the region's geography which includes the location of neighboring towns; the locations and relative amounts of various types of land; and the presence of rivers, lakes, and streams. Geological limitations include factors such as soil types, water tables, leaching rates, and other characteristics unique to that particular region.

Subject Areas

Agriculture
Biology
Chemistry
Conservation
Earth Science
Ecology
Environmental Science
General Science
Mathematics
Physical Science
Physics
Vocational Class

I-A. Science/Technological Factors

2. Recycling

The development of recycling processes, separation techniques for ferrous and non-ferrous metals, and glass recovery systems make better use of resources while lowering the demand for landfill sites by as much as 40%. Many new energy recycling processes are currently being studied, such as methane generators, and refuse-powered electrical generating plants. The development and use of these systems could reduce further the amount and type of materials requiring landfill.

3. Health Hazards

Biology
Chemistry
Ecology
Environmental Science
Geology
Health
Physiology

Landfills may pose many direct and indirect health hazards through contamination of underground water supplies, attraction of undesirable animals, possible human and animal exposure to hazardous substances, and the entry of these substances into plant and animal food chains.

I-B. Social Factors

1. Desire for Convenience

Economics
Environmental Science
Social Studies

People's desire for convenient living has encouraged the use of disposable products. The desire by manufacturers to sell more products has led them to produce products with shorter life spans, encourage style changes and fads, and use unnecessary and over-sophisticated packaging. All of these trends lead to wasted resources and an increased amount of refuse. Many people prefer the convenience of throwing away what they have finished with and ignore all volunteer programs to recycle items such as cans, glass, paper, clothes, and furniture.

Subject Areas	
	2. Desire for a Sound Environment
Civics Government Health	People's desire for a beautiful and healthy environment has led to many local and state ordinances forbidding garbage along roads, in woods and in parks, and unsightly or unhealthy refuse in yards. Open burning of refuse, or disposal of it in open dumps is also generally forbidden. Thus, sanitary landfill sites become the only legitimate repository for refuse, however even sanitary landfills are limited by zoning regulations in order to remove them from urban and suburban areas.
	3. Community Growth
Civics Economics	Present economic theories propose that continued population and community growth are necessary for a prosperous economy. Population growth supports industrial expansion and the building trades and results in a growing demand for services. New industry and services provide jobs for the growing population.
	4. Public Concern for the Environment
Civics Environmental Science History	The public has recently become more concerned with conserving our natural resources and protecting the local environment. Ecology, public interest and conservation groups are having a more powerful influence on governments and beliefs.

II. EVALUATION OF ALTERNATIVES

The Forsyte City Council consulted their regional planning commission in order to determine what the possible alternative solutions were to their present dilemma. Some alternatives were discarded after brief discussion since federal or state regulations made them illegal or impractical. Laws controlling air and water degradation made incineration and slurrying (grinding garbage to bits and adding

it to water) impractical. In any case, these alternatives were not really solutions to the solid waste problem, but simply changed its form to an air or water pollution problem. Shipping wastes to the sun or outer space would be prohibitively expensive and a fantastic waste of resources (fuel, metals, technology).

The city council also considered limiting community growth, an alternative already adopted by many communities as a partial solution to a variety of environmental problems. Since this alternative was compatible with other alternatives the council recommended that the local planning commissioner study the feasibility of using zoning and development restrictions to limit future growth.

Reducing the amount of refuse per person was identified as another partial solution. This could be accomplished by requiring deposits on bottles and cans (as in Michigan, Oregon and Vermont), restricting the use of unnecessary packaging and the sale of throw-away products, increasing the useful life of appliances and other products, and encouraging and developing recycling programs. These steps would require important changes in people's priorities (i.e. conservation over convenience) and major legislative support. Although the Forsyte city council considered local incentives and restrictions to reduce the amount of refuse generated, they felt that most of these would only be effective at a state-wide level.

Three alternatives remained - continued landfill on less appropriate sites, the establishment of a resource recovery system, or shipping solid waste to another locale. The three alternatives were evaluated at length and are presented on the following pages.

Subject Areas	II-A. Science/Technological Factors
	1-2. Is Reliable Technology Available? What Energy and Resources Must be Used?
Business Chemistry Economics Environmental Science Physics Vocational Education	The technological requirements for landfill operations and for long distance transport systems are satisfied by presently available techniques. Methods for improving inappropriate landfill sites have also been developed. In either case substantial amounts of energy (in the form of fuel), land and other resources will continue to be consumed or thrown away. Resource recovery systems, while still experimental, are able to recycle valuable ferrous and non-ferrous metals, glass, and paper products. Significant amounts of energy (in the form of heat, electricity) have been recovered from waste materials, while the materials themselves have been converted into useful by-products. Resource recovery systems are also being developed to effectively process sludge from sewage treatment systems and safely dispose of toxic substances. However, these systems have not been fully evaluated.
	3. What Will Be the Environmental Impact of the Alternatives?
Biology Chemistry Civics Ecology Economics Environmental Science Geology Mathematics Physiology	Areas which are used as landfill sites are often rendered undesirable for commercial or residential development, although some have been successfully developed as recreational areas. The use of less suitable landfill sites increases the dangers of leaching, dangerous settling, etc. Transporting solid wastes to another area merely moves the problem from one spot to another, at an ever-increasing cost. While no local resources are consumed directly, much energy is required to collect and transport the tremendous volumes of waste material generated by a local

Subject Areas

Biology
Chemistry
Civics
Ecology
Economics
Environmental Science
Geology
Mathematics
Physiology

community. As transportation distances increase, the energy requirement rapidly becomes overwhelmingly large. Long distance travel also contributes to air pollution problems. In addition, the area to which the waste materials are taken will still have to find ways to accommodate the large volume of materials.

Resource recovery systems eliminate much of the requirement for landfill sites and their associated hazards. The material that does require landfilling is reduced in volume by 40% (more when waste is burned for fuel) and quantities of hazardous materials are substantially reduced. While the site development involved in establishing a resource recovery plant does involve some impact on the local environment, the impacts are similar to those associated with other forms of land development and can be closely controlled. Resource recovery plants constantly monitor impacts on local air and water supplies.

4. Which Alternative Makes the Best Use of Local Resources?

Ecology
Environmental Science

Although landfilling can upgrade marginal land, the landfill sites available in Forsyte are already prime farming land and they would be degraded by conversion to landfills. Landfills also result in a continuing drain on local resources and energy supplies.

Business
Economics
Geography
Physics

Transporting wastes to other communities may make efficient use of existing collection and transfer facilities, but is not energy efficient. In addition, resources are constantly flowing out of the community.

Subject Areas

Resource recovery systems utilize presently existing waste collection and transfer systems. They recover valuable resources and energy which can be reused locally. The useful life of local landfill sites is greatly extended.

5. Does the Alternative Pose Any Health Hazards?

Biology
Chemistry
Civics
Ecology
Economics
Environmental Science
Geology
Mathematics
Physiology

Current landfill operations have many potentially hazardous effects on local environments. Hazardous substances placed in landfills may enter local water supplies, food chains, or the atmosphere. Inadequately prepared and maintained landfills are potential breeding grounds for germs and animal pests and provide an unnatural food supply for wildlife.

Long distance transportation of solid wastes would increase air pollution problems in the area due to vehicle emissions.

Resource recovery and energy recovery plants would have to solve problems of air and water pollution if processes involved burning or the use of water in refuse sorting operations.

II-B. Social Factors

1. What are the Capital Expenditures?

Economics
Environmental Science

Landfill would involve buying valuable land for more landfill sites, preparing them for sanitary landfill and buying the necessary refuse moving equipment. Continued buying and preparation of less and less suitable land would result in increased capital expenditures over time.

A resource recovery plant would involve buying one site and building the equipment and plant facilities required for recovering aluminum and other metals, glass, paper, energy, etc. Some landfill would also be necessary for non-recoverable waste.

Subject Areas

Shipping refuse to a different locale would require investment in long distance transport equipment and perhaps intermediary collecting facilities.

2. What are the Operating Costs?

Economics
Environmental Science

The costs of collection and transportation of refuse to a central location comprise a major proportion of the operating costs and would be the same for all three alternatives.

Operating costs for landfill sites involve labor, fuel, upkeep of machines and fill material; these can be accurately predicted.

Operating costs for resource recovery plants involve labor, energy and upkeep of machines, but these costs should be offset by savings from the sale of energy produced and of recovered resources. Operating costs could fluctuate wildly if market for these resources is unstable.

Operating costs for long distance transport will rise significantly as fuel costs and fees paid to the other locale (for taking the refuse) increase over time.

3. Is There any Federal and State Support?

Civics
Economics
Government

Each state licenses landfill operations and requires them to meet (EPA) standards.

The Federal Resource Conservation and Recovery Act (1976) provides federal support grants for planning solid waste management systems, constructing and operating demonstration projects, and research involving resource recovery.

4. Would Regional Operation Be More Efficient?

Business
Civics
Economics
Government

Regional landfill operation might be too large to manage efficiently. Landfill sites would fill up faster, refuse would have to be shipped farther. On the other hand, there would be less duplication of equipment and labor.

Subject Areas

Regional waste recovery programs generally increase efficiency since a certain minimum mass of solid waste is required to recover some materials economically and fuel the energy recovery plant. A Regional plant also avoids duplication of facilities. However, a new governmental authority coordinating the plans, financing and needs of local governments would be required.

If the communities join together to ship waste to another locale, the waste must be shipped a greater distance and greater demands will be made on the landfill site that is used.

5. Does the Alternative Coordinate With Other Land Use Plans?

Civics
Economics
Environmental Studies

In Forsyte the major land available for landfill would be taken from prime farming use. It would also make surrounding lands less desirable for development.

A resource recovery plant could arrange to sell its recovered energy and resources to local industry and government. Little transportation of products would be required.

Transportation routes from the city would be sufficient for long distance shipment of refuse.

6. What Would Be the Long Term Economic Impacts?

Economics

Industry and community development would be limited by the capacity of landfills or of long distance shipping operations to handle their refuse. This capacity can be expected to decrease rather than increase over time. A resource recovery plant should be able to reduce waste disposal costs for industry and actually supply some raw material or energy for industrial use.

Subject Areas

7. Can the Alternative Receive Local Support?

Civics
Government

Environmental, conservation, and naturalist groups should prefer resource recovery systems to landfill and transporting refuse which waste resources, land, and often add to pollution problems. Groups favoring lowered taxation and reduced government bureaucracy may be against regional resource recovery unless or until they can be convinced of its long term economy.

The local government may not like giving up autonomy or power to a regional authority or may feel unable to finance the initial capital investment required by a resource recovery system.

Machinery and fuel suppliers may prefer landfill and transporting while real estate developers might prefer resource recovery (which would keep more land accessible for development).

8. What Changes in Life Style Would be Required?

Civics
Sociology/Psychology

Neither the continued use of landfill nor the transporting of refuse out of the locale will require immediate changes in life style by citizens. The feasibility of these alternatives is limited, however, by the continued availability of new sites.

A waste-management system may require sorting or special practices by citizens and would probably require the education of citizens as to the workings and advantages of the system. Economic incentives might encourage citizen participation.

Subject Areas

9. What Are the Long Range Savings or Costs?

Economics
Environmental Science

Continued landfill and transportation of garbage out of the locale would result in a significant long term loss of resources, land, and fuel. Both landfill and transportation will become progressively more expensive as costs of purchasing landfill sites and transportation costs increase. Landfill also involves the added costs of repairing possible pollution of surrounding water table or streams, disruption of animal and other natural life cycles, and possible health hazards. Air pollution is also increased by long distance transportation.

A regional resource recovery plant can recover and recycle significant amounts of resources and energy, reduce the chances of pollution and health hazard and waste less land and fossil fuel.

III. RESULTS

After discussing each alternative at length, the Forsyte City Council decided that it would prefer the long term benefits of saving its prime farming land, resources and energy by instituting a resource (and energy) recovery plant, if it could find the necessary capital and public support. It cooperated with other nearby communities in requesting financial assistance from the federal and state government for the planning and construction of a regional resource recovery plant. This assistance was able to off-set the high capital costs of building the plant. It also negotiated sales contracts for the recovered resources with local industries and the electric utility. The citizens of Forsyte, who were relatively forward looking and environmentally concerned, gave their support to the enterprise both by approving a building bond issue and by performing the required sorting of refuse. The following changes are anticipated results of the proposed action.

Subject Areas	III-A. Science/Technological Factors
	1. Recovery Capacity
Business Economics Environmental Science Physics Physical Science	Large scale systems designed to meet the needs of an entire region can recover practical amounts of energy and materials which can be directly or indirectly utilized to maintain the operation of the facility.
	2. Environmental Impacts
Biology Ecology Geography Geology Physiology	By establishing a single, well-located regional facility, any impacts on local environments are minimized. In addition, hazardous substance disposal is carried out in only one well-equipped location, thereby reducing the health risks due to accidental mishandling of materials.
	3. Flexibility of Operation
Chemistry Environmental Science Physical Science	Regional resource recovery systems often combine a number of different processes, each of which can be expanded, altered, or eliminated, depending on future needs or technical innovations.
	4. Research Capabilities
Chemistry Civics Economics Environmental Science Physics Physiology	Regional resource recovery systems can be designed to serve as research facilities, investigating a wide variety of scientific and environmental issues, such as identification and disposal procedures for toxic substances, energy and resource recovery techniques, and conversion of wastes into useable materials.
	III-B. Social Factors
	1. Establishing a Regional Structure
Civics Economics Environmental Science Government	The establishment of a regional waste-management authority requires the designation of local authority, cooperation in planning and cooperative financing by local governments.

Subject Areas

2. Costs

Business
Economics

The regional organization should result in lower per capita costs because it eliminates duplication of effort and facilities. The increased size of the operation should promote efficiency and cost-effectiveness (mass production concepts). The sale of recovered resources should also reduce operating costs.

3. Federal and State Support

Civics
Economics
Government

The federal government through the Federal Resource Conservation and Recovery Act (1976) provides grants for planning, demonstration projects and research funds. States may also provide planning support, the necessary licensing and financial subsidies. Other funds for capital investment in a waste treatment plant may come through bond issues.

4. Public Involvement

Civics
Sociology

A major educational program to increase citizen awareness of the value of refuse as a resource and the importance of sorting refuse for proper resource recovery might be supplemented by a system of incentives or fines to encourage the use of appropriate disposal methods.

Steps might also be taken to make citizens aware of the wastefulness of producing throw-away products, unnecessary packaging and products designed with an unnecessarily short functional life (e.g. toys or appliances of low durability and difficult to repair). The reduction of unnecessary waste reduces not only the amount of refuse, but the drain on our natural resources.

5. Long Term Environmental Changes

Economics
Environmental Science
Health

Long term environmental costs should be reduced in several ways. The necessity for cleaning up future water pollution or health hazards caused by refuse should be

reduced. The recovery and recycling of resources should reduce the depletion of natural resources and the pollution and costs of developing and processing new resources. Less land will be needed for land-fill sites and the saved land may be more productively used.

6. Community Development

A regional plant can provide a focus for comprehensive community planning. New industries can make use of the recovered resources or government buildings can use the generated heat and electricity if located near the site. Compost materials for farmers or suburbanites, special research facilities using some of the recovered resources, and a coordinated sewage treatment plant are other planning possibilities.

SAMPLE TEACHING UNITS

Environmental issues may be used as the basis for a project taking one day or one week or may simply be mentioned as being relevant to a subject or concept being discussed. With the repeated mention of such issues and of the planning used to resolve or anticipate them, students should become more aware of what can be done to reduce man's negative impact on the environment.

On the following pages are two teaching units utilizing the issue-oriented approach; each is based on the issue of solid waste management. The first is an example of how an environmental planning issue can be related to several concepts in an introductory physical or environmental science class. The second is a more extensive unit designed for a government or civics class; it uses an issue to develop a rationale for the establishment of regional governmental and planning organizations. Each unit is introduced by a list of objectives. A list of suggested activities and progress checks is provided for each group of related objectives.

The teaching units which follow are "partial products." Additional information will be required in order to conduct some of the activities in these units. Some sources for this information are suggested within the descriptions of the activities. More comprehensive listings of information sources are located in Part II of this supplement. Teachers who plan to use these units should be aware that they are not complete. They represent a set of ideas about teaching these topics which will require adaptation to the local scene as well as filling in of detail. The sources of information that will permit teachers to add detail and make local adaptation are listed in Part II of this report (see pp. 35-74).

HOUSEHOLD REFUSE AS A RESOURCE

Objectives

At the end of this unit, the student should be able to:

1. Identify the various components of household refuse.
2. Measure the relative amounts of metals; glass; paper and other combustibles such as food particles, wood, and plant fibers; plastic; moisture; and other non-combustible solids and liquids.
3. Name the components of household refuse which can and cannot be recycled.
4. Describe the processes used to separate the components of household refuse.
5. Describe ways that household refuse can be recycled into useful products.
6. Describe ways the energy can be recovered from household refuse.
7. Name the advantages and disadvantages of recycling materials instead of throwing them away.
8. Describe the effect that increased recycling would have on local landfill operations.
9. Appreciate the value of household refuse as a resource.
10. Describe the amount of household refuse necessary to efficiently operate a recycling plant.
11. Determine the size of an area large enough to supply a recycling plant with sufficient household refuse for efficient operation.
12. Describe ways that citizens can help to increase the amount and efficiency of recycling.

Because the objectives for this unit are already quite specific, additional progress checks are not included.

Objectives

1. *Identify the various components of household refuse.*

2. *Measure the relative amounts of metals; glass; paper and other combustibles such as food particles, wood, and plant fibers; plastic; moisture; and other non-combustible solids and liquids.*

Activities

A. Have the students record the weight and volume of several large bags of household refuse. Separate contents of the weighed bags into piles of combustible and non-combustible items.

   Further separate the combustibles into piles of paper, food wastes, wood and garden refuse, and other miscellaneous items such as leather, rags, plastic, and rubber.

   Separate the non-combustibles into piles of metals, glass, and other miscellaneous non-combustible items.

   Measure and record the weight and volume of each of the piles of combustible and non-combustible items. Allow the piles to dry (at least overnight), then reweigh to determine how much moisture was present. Express the weight of each component as a percent of the total amount of refuse.

   Describe the physical and chemical properties of each type of material found in the refuse. Discuss the relationship between the properties of the materials, and their commercial uses.

B. As an alternative to sorting and classifying bags of refuse at school, students could perform the tasks at home, record their findings, and bring the data to school for further analysis. This activity could be preceeded by a classroom demonstration of sorting and classifying techniques using bags of household refuse provided by the teacher. This would effectively reduce the space requirements and eliminate much of the mess that would otherwise accompany the activities.

   Students might also conduct the measurements as part of a field trip to a local landfill site. Such a trip would introduce additional concepts and skills relating to field measurement techniques, equipment requirements and organization strategies.

Objectives

3. *Name the components of household refuse which can and cannot be recycled.*

4. *Describe the processes used to separate the components of household refuse.*

5. *Describe ways that household refuse can be recycled into useful products.*

Activities

A. Using the descriptions of refuse prepared in previous exercises, determine which piles of refuse contain materials that might be recycled. Develop simple consumer-oriented strategies for separating recyclable materials from materials which seem to have no further use.

B. Identify several different separation processes used by recycling centers (see Activity C) and discuss the basic principle involved in each method. Decide which methods might be most appropriate for separating household refuse.

C. Conduct a field trip to a recycling or resource recovery center. Examine the various techniques such as shredding, magnetic separation, air classification, and screening which are used to recycle.

D. Construct a list or table of possible reuses of the materials in each pile. Diagram the steps that might be taken in recycling waste materials into usable products. Collect examples of products made from recycled materials such as paper products, car batteries, and metal containers to illustrate the various application of recycling.

E. Construct a display illustrating the stages in the life of an aluminum can or glass bottle from the time it is formed until it is finally discarded.

Objectives

6. *Describe ways that energy can be recovered from combustible household refuse.*

Activities

A. Review processes by which energy can be released from materials and relate the processes to the types of materials found in household refuse.

B. Conduct calorimetry experiments to determine the amount of heat energy that is contained in samples of the various types of household refuse. Use the results to calculate the total heat energy available in the materials. If calorimetry equipment is not available, the energy content of the refuse can be calculated using the data in the table located at the end of this unit.

C. Examine several large scale methods being developed to recover energy from refuse in terms of their efficiency, general applicability, technical complexity, and fuel requirements (see information section for sources of materials). Compare the amount of energy recoverable from refuse to the amount of fossil fuels that would be required to produce a similar amount of energy.

D. Examine the piles of household refuse to determine how each component would be recycled, used for energy recovery, or discarded. Simulate or perform the appropriate recycling process on each pile. Compare the remaining volume of material to the initial volume of refuse.

Objectives

7. *Name the advantages and disadvantages of recycling materials instead of throwing them away.*

8. *Describe the effects that increased recycling would have on local landfill operations.*

Activities

A. Review the observations and conclusions reached in all previous activities. Identify and discuss the various positive and negative aspects of recycling: Include topics such as the ability of recycling to help conserve resources and energy, the reduced requirement for landfills and their associated hazards and costs, the environmental dangers of recycling and resource recovery systems (possible air and water pollution, noise pollution, high costs, risks associated with using new technological processes), and the attitude of the public towards recycling.

B. Construct charts or diagrams illustrating the ways that recycling operations can affect other parts of the environment.

Objectives

9. *Appreciate the value of household refuse as a resource.*

10. *Describe the amount of household refuse necessary to efficiently operate a recycling plant.*

11. *Determine the size of an area large enough to supply a recycling plant with sufficient household refuse for efficient operation.*

Activities

A. Review the concept of resources. Determine the resource value of the household refuse used in the prior activities by considering the value of the materials and energy contained in the refuse and the altered impact on local environemnts. Discuss the question "Are people ready to attach a higher value to household refuse?"

B. From technical documents published by resource recovery commissions (see information section), determine the fuel requirements of various recycling plants, emphasizing the amount of refuse necessary for efficient and economically feasible operation. From local census data and average family refuse generation data, determine the boundaries of a local area containing sufficient people to supply a recycling plant with enough refuse. Compare the size of this area with the size of already established governmental areas (city, township, county, region).

C. Determine which political areas, or combinations of areas, are large enough to support a recycling operation. Discuss the impact of other forms of refuse (industrial, sewage, agricultural) on the total amount of available refuse, and the area required to support a recycling operation. Determine similar boundaries for an area whose character is opposite to the local area (urban vs. rural, industrial vs. residential or recreational). Identify advantages and disadvantages of recycling for each type of area.

Objectives

12. *Describe ways that citizens can help to increase the amount and efficiency of recycling.*

Activities

A. Examine local efforts to promote recycling activities. Visit a recycling center or the regional planning office, or engage speakers from local environmental groups to obtain information on local recycling programs, cleanup campaigns, feasibility studies and public education programs. Develop strategies for promoting recycling activities at home, in schools, and in public areas.

* * * *

SUPPLEMENTAL DATA FOR HOUSEHOLD REFUSE TEACHING UNIT

Composition and Properties of Typical Shredded and Air-classified Solid Waste[1]

REFUSE COMPOSITION		
	Weight percent	
Component	Wet basis	Dry basis
Glass	5	5
Metal	2	2
Paper	45	34
Plastics	4	4
Leather, rubber, textiles	4	3
Wood	4	3
Food wastes	17	7
Yard wastes	18	11
Miscellaneous	1	1
Moisture		30
Total	100	100

Heating value = 2775 cal per gram (5000 BTU/pound)
Bulk density = 96-100 kilograms per cubic meter (6-10 pounds per cubic foot).

[1]Chapman, Richard A., Solid Waste Systems For Energy Conversion, In "Energy Technology Handbook," Douglas M. Considine, Ed., McGraw-Hill Book Company, New York, 1977.

Typical BTU Values of Fuels (High Heating Value)[1]

Coal	BTU/Pound
Anthracite	13,900
Bituminous	14,000
Subbituminous	12,600
Lignite	11,000
Heavy fuel oil	**BTU/Gallon**
No. 4 heavy fuel oil	144,000
No. 5 heavy fuel oil	150,000
No. 6 heavy fuel oil, 2.7% sulfur	152,000
No. 6 heavy fuel oil, 0.3% sulfur	143,000
Gas	**BTU/cubic foot**
Natural	1,000
Liquefied gases	**BTU/Gallon**
Butane	103,300
Propane	91,600

[1]Klooster, H.J., The Total Energy Concept in Refinery and Process Plant Planning, in "Energy Technology Handbook," 1977.

ROLE OF REGIONAL ENVIRONMENTAL PLANNING IN TODAY'S GOVERNMENT

Objectives

1. The student will understand that planning is a multi-step process which establishes a method for attaining a desirable goal.

2. The student will realize that environmental planning considers mans' needs and desires, evaluates their impact on the surrounding environment and strives towards compatibility between the two.

3. Students will be able to describe some of the problems involved in solid waste management.

4. Students will be able to discuss the positive and negative aspects of several solid waste disposal alternatives.

5. Students will view enviromental planning as necessary to the solution of these problems.

6. Students will realize that federal and state governments cannot effectively deal with this issue.

7. Students will understand that local governments are frequently too small to develop and finance an effective solution to their solid waste problems.

8. Students will understand that regions are areas which have something in common (similar geography, similar problems, similar weather...).

9. Students will understand why planning regions are established (i.e. to solve a common problem, to more effectively plan growth and development).

10. Students will be familiar with the organization and function of their regional planning agency.

11. Students will realize that regional planning is often the most effective means of handling environmental issues.

12. Students will be aware of current public attitudes regarding the establishment of regional governments.

I. THE PLANNING PROCESS

Objectives

1. *The student will understand that planning is a multi-step process which establishes a method for attaining a desirable goal.*

2. *The student will realize that environmental planning considers man's needs and desires, evaluates their impact on the surrounding environment, and strives towards compatibility between the two.*

Activities

A. Teacher presentation - a short lecture or discussion including examples of planning (e.g., student preparing for a vacation, politicians preparing for election day, things that have to be decided before a subdivision is actually constructed...).

B. Have a guest speaker from the regional planning commission or local zoning commission present an overview of the role of environmental planning in community development.

C. Teacher presentation - a short lecture or discussion summarizing examples of environmental planning (e.g., environmental impact statements, federal clean air and clean water standards, choosing a landfill site).

D. Obtain several different types of planning documents from local government offices, planning commissions, developers, etc. Have students examine their similarities and differences. Focus on aspects of documents which relate to the environment, such as land use recommendations, analyses of environmental impacts, open-space dedications, and placement of transportation routes in relation to commercial and residential areas.

E. Have students identify local projects which would involve environmental planning (e.g., subdivisions, roadways, nuclear reactor sites, recreation developments). Acquire the plans for one of these projects from the developer, or the local planning commission. Examine the plan to determine the various types of data, alternatives, and decisions that were made during the developmental stages of the project.

Progress Check

You are making progress toward your objective if students:

1. Can describe the basic steps in the planning process, including 1) an analysis of the character of the region, 2) analysis of the current state of the region, 3) definition of issues facing the region, 4) formulation of a set of goals which will resolve the issues, and 5) establishment of strategies for achieving the goals.

2. Can name several organizations that engage in planning activities.

3. Can discuss the goals of planning and why planning is necessary.

4. Can describe how the environment might be affected by a development project.

5. Can give examples of projects where environmental planning was not used.

II. ISSUE

Objectives

3. *Student will be able to describe some of the problems involved in solid waste management.*

4. *Students will be able to discuss the positive and negative aspects of several solid waste disposal alternatives.*

5. *Students will view environmental planning as necessary to the solution of these problems.*

Activities

A. Obtain films, brochures, pamphlets or materials illustrating solid waste management practices from state and local government agencies, planning agencies, or film libraries. Utilize those which present both the positive and negative aspects of solid waste management.

B. Conduct a field trip to landfill or solid waste management facility or recycling center to examine local solid waste management practices.

C. Students could calculate the volume and types of solid waste produced by their community. How much could be recovered and reused? (Data for this activity can be obtained from environmental science texts, resource recovery commission documents, or local planning agencies.)

D. Panel discussion: Should laws be passed that reduce the amount of solid waste (i.e. deposit on all cans and bottles, simplified packaging, mandatory paper recycling, mandatory product durability standards, subsidizing the use of recyclable resources). Some data regarding the effects of "bottle bills" are available from states that have enacted such legislation; other data may be obtained from packaging industries, resource recovery commissions, or special interest groups (see information section).

E. Mapping activity: a) locate major sources of solid waste, b) locate present landfill sites, c) identify sites for future landfills.

F. Write a futuristic paragraph describing life if no planning for solid waste disposal is instituted.

Progress Check

You are making progress toward your objective if students:

1. Can name the main sources and components of solid waste.

2. Can describe the problems or steps involved in disposing of solid waste.

3. Can name the advantages of planning/disadvantages of not planning for future solid waste disposal.

III. CAN FEDERAL, STATE AND LOCAL GOVERNMENTS DEAL EFFECTIVELY WITH THIS PLANNING ISSUE?

Objectives

6. *Students will realize that federal and state governments cannot effectively deal with this issue.*

7. *Students will understand that local governments are frequently too small to develop and finance an effective solution to their solid waste problems.*

Activities

A. Read the Federal Resource Conservation and Recovery Act and state resource recovery acts, or summaries of the acts, such as those found in the Environmental Reporter (see General Information Section, Part II). Emphasize sections that designate authority, establish planning requirements and agencies, etc.

B. Use maps to illustrate number and location of landfills for several counties. Discuss duplication of facilities, manpower, machinery, costs, etc. Determine their approximate distance from urban areas. Discuss questions such as, "Why are landfills located as they are?", "Were these locations planned, or did they just happen?", "What criteria were used to establish the sites?"

C. Using data describing the economics of scale for resource recovery plants and local census data, have students determine the boundaries of an area large enough to support a resource recovery operation. Consider the amount of refuse generated by the average family, the number of families that would be needed to generate sufficient refuse to operate the plant, and the area that would have to be encompassed to include sufficient numbers of families. Compare this area to already established political areas such as cities, townships, or counties.

Progress Check

You are making progress toward your objective if students:

1. Can discuss problems such as a lack of familiarity with local conditions or lack of specific regulatory structures that federal and state governments would encounter if they attempted to deal with a local solid waste issue.

2. Can give the approximate number of people (or amount of solid waste) needed to keep a solid waste management system functioning efficiently.

3. Can describe some of the problems local governments would encounter in attempting a solid waste management project.

IV. REGIONAL PLANNING

Objectives

8. *Students will understand that regions are areas which have something in common (similar geography, similar problems, similar weather...).*

9. *Students will understand why planning regions are established (i.e. to solve a common problem, to more effectively plan growth and development).*

10. *Students will be familiar with the organization and function of their regional planning agency.*

11. *Students will realize that regional planning is often the most effective means of handling environmental issues.*

12. *Students will be aware of current public attitudes regarding the establishment of regional governments.*

Activities

A. Determine and summarize the characteristics of several different types of regions. Illustrate the existence of natural and artificial regional boundaries.

B. Collect information from state and local governments, planning agencies, libraries, or local citizens describing how local regional boundaries were established. Discuss why boundaries were set at a particular place.

C. Discuss federal and state legislation which requires the establishment of regional planning districts.

D. Contact the regional planning agency or attend planning agency meetings to determine the specific structure and functions of the agency (could be combined with Activity B in Section I).

E. Construct or obtain charts illustrating the involvement of the planning authority in local issues, their funding sources, and the interaction of planning agencies with local governments.

F. Panel discussion or debate: Regional Environmental Planning - Pro and Con (this activity could serve as a final summary for the unit). Emphasize social attitudes towards new, broader governmental structures.

G. Analyze several environmental issues for common characteristics which would require a regional planning approach.

H. Identify the steps that a regional planning agency might take to plan a solution to the solid waste problem.

Progress Check

You are making progress toward your objective if students:

1. Can describe several types of regions (geographic, climatic, political), naming characteristics common to the entire area.

2. Can describe the nature of the problems handled by regional planning agencies.

3. Can briefly describe the historical development of regional planning agencies.

4. Can name the units of local government (counties, cities, etc.) which comprise their planning region.

5. Can describe several of the functions of planning agencies.

6. Can name several regional or local issues in which the planning agency is involved.

7. Can describe how regional planning agencies are funded.

8. Can describe the benefits and drawbacks of planning at the regional level.

9. Can identify other environmental issues for which regional planning is appropriate.

PART II
INFORMATION SOURCES FOR ENVIRONMENTAL PLANNING TOPICS

HOW TO USE THESE INFORMATION SOURCES

In order to search for and efficiently request information from governmental and non-governmental agencies one must know enough about both the topic and the agencies to know exactly what to request from whom. Therefore, this section first lists possible environmental topics related to five major environmental planning areas (land use, transportation, water quality, air quality and solid waste management) and then describes the basic environmental planning legislation and the basic structure for regulating, administering and implementing appropriate environmental legislation at the federal, state, regional and local levels.

Specific information sources are presented for each environmental problem area. A general information section is provided at the end of this section for organizations and publications relevant to several problem areas. The specific and general information sources include names, addresses and brief descriptions of the type of information that the sources can provide.

After quickly reading through the outline for a particular environmental problem area, a teacher can more effectively make use of both the specific information sources suggested for the area and the general information sources presented at the end of the section.

LAND USE

I. TOPICS

Housing and residential development: planning for different family sizes, incomes, age groups and life styles; solving rural development and suburban sprawl problems; conserving and rehabilitating existing neighborhoods.

Commercial and industrial development: avoiding uncontrolled strip development; planning for services (e.g. utilities, transportation); reducing negative effects of or competition among different land uses.

Community services and institutions: sufficient and centrally placed schools, libraries.

Recreation: parks, natural areas, camping, hiking, swiming, and boating facilities.

Natural Resources: developing and conserving natural resources such as forests, agricultural land, watersheds, wet lands, coastal zones.

Related Topics: air and water quality; noise pollution; sewage; solid waste disposal; urban storm run off; transportation; economic development (many of these topics are discussed in other sections).

II. PLANNING

A. Federal

Section 701 of the Housing Act of 1954 provides funding to regional or local agencies for comprehensive planning, and management activities which promote national policy objectives (i.e. community conservation and aid to distress cities

and places, expansion of housing and employment opportunities, promotion of orderly and efficient growth. A comprehensive plan, which must contain at a minimum citizen participation, a housing element, and a land use element, must be completed before regions or local governments can receive additional planning and some development related funds.

Over two hundred federal assistance programs require that applications for project funds or technical assistance first be submitted to regional and/or state planning agencies. After review of the project, these agencies make non-binding recommendations which accompany the application to the appropriate federal agency. This process of review by regional and state planning agencies is known as the A-95 review function, which is authorized by the Office of Management and Budgets Circular No. A-95.

B. Multi-State

Multi-state regional planning cooperation has been instituted by many states to deal with common problems, which usually involve economic development, but may also be concerned with such problems as conservation and water supply. These multi-state programs are administered by the state governors offices or a council of federal and state agencies. Examples are the TVA, Great Lakes Regional Commission, and the Appalachian Commission.

C. State

All states have coordinative policy development and/or planning offices. Some are separate departments, some operate as a part of the Governor's office and some are coordinated with the departments of budget, economic affairs or community development. They are concerned with many types of planning

besides land use (e.g. economic, manpower, resource). Some act as the lead agency for A-95 clearinghouse review and environmental impact reviews, as well as liasons between local and regional programs and federal agencies.

Many departments within the state government have their own planning staff in such areas as housing, transportation, natural resources (e.g. Bureau of Recreation and Land Use); however, they do little planning or regulation of land use as these functions have been largely delegated by the states to local governments.

D. Regional

Almost all states have designated (and most have made operational) sub-state or intrastate regional planning organizations. There are over 600 such organizations in the U.S. with 535 serving as A-95 clearinghouses. These regional councils are funded cooperatively by state and local sources, along with significant funds supplied by federal grants. The councils provide important advisory research, information and planning functions both region wide and strictly local to their constituent local governments.

E. Local

Cities, counties, townships and other local units of government generally have their own planning board and/or planning staffs. Local government officials such as mayors, township supervisors, or county commissioners also take part in planning decisions. Most planning of private land use takes place at the local level.

III. REGULATION, ADMINISTRATION AND IMPLEMENTATION

A. Federal

The federal government as a major land owner manages and administers national forests, park lands and natural areas. The Federal Land Policy and Management Act (1976), The National Forest Management Act (1976), The Wilderness Act (1964) and The Wild and Scenic Rivers System (1968) all provide authority for conservation and balanced management of natural resources on federal land. Federal regulation of nonpublic land is generally limited to air and water standards and will be described under these topics. Minimum federal standards also exist in such areas as federally subsidized or insured housing.

B. State

At least 40 states have established housing finance and development agencies that provide financial or lending assistance to encourage the development of a sufficient low and moderate-income housing stock. Some states also have programs for the improvement and rehabilitation of old housing. Community development and community affairs offices in many states are concerned with improving housing and community services (e.g. schools, parks, libraries). Almost half of the states have enacted enabling legislation to enhance their local governments' ability to finance redevelopment projects.

Some states have passed state-wide laws concerning general land use control, specific use regulations (e.g. for flood plains, wetlands, shorelands), building codes, anti-redlining policies, and tax incentives or other policies to encourage efficient energy use in homes and buildings.

C. Local

State enabling legislation allows local governments to create and enforce such regulations as zoning laws, subdivision controls and buidling codes. These regulations are administered by departments such as the zoning office, planning commission, or housing authority. Local governments and organizations generally implement housing and community development programs. Local governments use the plans and zoning suggestions developed by regional planning agencies to encourage and make decisions about local development and regulate land use.

IV. INFORMATION SOURCES

A. Federal

Looking for specific information from the federal government can be quite complex and time consuming. Frequently, local senators and congressmen can obtain the information for you more quickly. For general information try the information offices of the following departments and their relevant divisions or units:

Department of Housing and Urban Development
- Neighborhoods, Voluntary Associations and Consumer Protection Division
- Community Planning and Development Division
- Office of Urban Policy

Department of Interior
- Fish and Wildlife and parks (National Park Service; Heritage Conservation and Recreation Service)
- Land and Water Resources (Bureau of Land Management, Office of Water Resources and Technology)
- Energy and Minerals (Bureau of Mines, Geological Survey)

Appalachian Regional Commission (for economic, physical and social development of the region)

Tennessee Valley Authority

Environmental Protection Agency (Office of Public Awareness)

B. State

The information offices of such state departments as, The State Planning Office, Community Development or Natural Resources can provide information or will guide you to other offices for more specific details.

C. Local

City planners, planning commissioners, mayors, supervisors or town councils can give detailed information about local planning and land use issues. They may also provide local maps and charts concerned with land use. Parks departments, schools and hospitals, can provide information on topics relevant to their own domains.

D. Other Local Sources

Local citizen's groups such as neighborhood and tenant's organizations, and historical societies can often provide information on land use problems touching their interests.

For more general information sources see the General Information section.

TRANSPORTATION

I. TOPICS

Highways and city streets: interstate, state and county roads, local congestion problems, the use and misuse of the private car.
Mass Transit: commuting, inter-city or county travel, rural transportation, "para-transit" (carpools, taxis, dial-a-ride services).
Transit for the elderly and handicapped: special transit systems for individuals who cannot use regular systems.

Non-motorized transit: bicycle paths, walkways.
Air and rail: passenger and freight systems.
Related Topics: land use, air and noise pollution, economic development, energy consumption, safety problems.

II. PLANNING

A. Federal

The Department of Transportation oversees all transportation administrations. It publishes reports (e.g. 1972 National Transportation Report) and collects and summarizes information from the states concerning multi-model transportation needs.

The Federal Highway Administration has developed and administered plans for the national interstate highway system. The Federal-Aid Highway Act requires that all metropolitan areas over 50,000 designate a metropolitan planning organization to develop mass transit and comprehensive highway plans for the area. Highway plans must be approved before the area can receive Federal Highway Act money (known as 3-C funding).

The Railroad Revitalization and Regulatory Reform Act (1976) requires states to develop and approve a state rail plan (plus meet certain legal requirements) before receiving federal funds for improving and modernizing rail service.

The Federal Aviation Administration is responsible for the planning and development of all air travel.

B. State

Thirty-seven states have organized departments of transportation to plan, and coordinate, all modes of transportation in the state. Each state is responsible for all systematic planning of its highway and railway systems. The federal Aviation Administra-

tion has recently allowed states more authority in the planning and development of airports and air travel within the state.

C. Regional

Both state and local governments frequently invest regional planning agencies with responsibility for planning regional and mass transit systems. Responsibility for plans necessary to receive urban area (3-C) funds is often invested in a regional or metropolitan authority. Bus, commuter rail and subway authorities are frequently regional in nature or cooperate with a regional organization in planning for mass transit needs.

The planning of bicycle routes and of transportation for the handicapped and elderly may be either regional or local in nature.

In land use studies regional planning organizations also recommend plans for adequate transportation facilities (rail, air, trucking) for industrial and commercial development.

D. Local

County and city governments (i.e. county road commissions, city and village public works or engineering departments) are generally responsible for local road and city street planning and provide input to regional and state planning agencies. Local governments are also responsible for the actual site planning of local roads.

III. REGULATION, ADMINISTRATION AND IMPLEMENTATION

A. Federal

The federal government provides the majority of funds for the planning and construction of all modes of transportation.

The Federal Highway Administration provides 90% funding for interstate highways and 70% funding for state, city and local roads. The monies are drawn from a Highway Trust Fund supplied by special-use taxes from highway users. Recent Federal-Aid Highway legislation (1973) allows states discretion in the use of these funds for mass transit programs. The Highway Act of 1976 allows for the more flexible utilization of federal funds by states.

The Federal Aviation Administration has major responsibility for regulating and administering airports and air traffic.

The Federal Railroad Administration regulates railroads and administers federal Conrail and Amtrak systems.

B. State

The state administers federal highway funds and provides matching funds for the state highway system. It also implements actual site planning, building and maintenance of interstate and state highway systems.

C. Regional

Regional agencies are not usually involved with the administration, implementation or regulation of transportation plans except for the A-95 review process.

D. Local

City and county governments provide a portion of the funds for their local roads and streets, and implement regional and local road plans through building and maintenance. Local governments frequently help finance, regulate and administer local mass transit authority, and cooperate with federal, state and private organizations in providing rail and airport facilities.

IV. INFORMATION SOURCES

A. Federal

The following federal departments and offices can provide information on national problems and planning of mass transportation:

Department of Transportation
- Federal Highway Administration
- Urban Mass Transportation Administration
- Federal Railroad Administration
- Federal Aviation Administration
- U.S. Coast Guard (Shipping)
- Highway Traffic Safety

National Transportation Safety Board

B. State

The State Department of Transportation (or its equivalent) can provide general planning information concerning, for example, state and inter-state highways, intra-state public transportation, and rail travel.

C. Regional

Regional plans for highways and mass transit (especially in metropolitan areas over 50,000) should be available through regional planning agencies. Rail and air travel information related to land use planning should also be available.

D. Local

Local highway departments and county road commissions are the best sources of information for specific highway sites and problems. Local or regional mass transit authorities (public or private) can provide information on their plans and operations.

E. Other Local Sources

Many interesting books have been written on the problems of the automobile and mass transportation. These problems are also described in transportation magazines in local libraries. For other information sources see the General Information Section.

AIR QUALITY

I. TOPICS

Particulate discharges: dust, dirt, lead, asbestos, radioactive dust.
Auto and industrial emissions: sulfur oxides, nitrogen oxides, carbon monoxide, carbon dioxide, hydrocarbons.
Photochemical smog
Ozone
Evaporation of industrial solvents

II. PLANNING

A. Federal

Federal legislation, in the form of the Federal Air Quality Act (1955, 1970, 1977) and the Clean Air Act (1963, 1970, 1977), mandated state planning for air quality. The legislation established time limits and air quality standards to be contained in the plans. These standards were determined by EPA in the form of National Ambient Air Quality Standards (1971). EPA also was given authority to designate, as necessary, air quality control regions within each state, and among states. Section 175 of the Clean Air Act provides funds and technical assistance for the development of regional air quality plans by designated agencies.

B. State

State governments have primary responsibility for developing and submitting State Implementation Plans to EPA. They also designate air quality regions within the state. These functions are usually the responsibility of air quality divisions in the state departments of environmental protection or natural resources.

C. Regional

Regional planning agencies develop regional air quality plans with the support of federal planning grants. They may be selected by EPA to develop model plans for typical urban/suburban areas. Related efforts by regional agencies include planning for efficient transportation systems and placement of industrial development sites in and around urban areas.

D. Local

With the exception of large urban areas, little air quality planning takes place at the local level.

III. ADMINISTRATION AND IMPLEMENTATION

A. Federal

EPA assists state and local agencies in the designation of air quality regions, estabishes and reviews air quality standards at least every five years, and issues necessary regulations to insure implementation of the provisions of the legislation.

B. State

State administrative agencies exist in the form of air pollution control commissions and air quality divisions which usually function within the state natural resources or conservation departments. These offices establish public education plans, administer tax exemptions, issue operating permits (in some states), and establish fee structures for state-operated pollution monitoring networks.

C. Regional

Most regions do little in the way of administering air quality plans, but they often act in an advisory capacity to state and local government agencies.

D. Local

Local government agencies establish appropriate zoning controls, local regulations, and specific operating procedures in accordance with Federal, state and regional guidelines.

IV. REGULATION AND ENFORCEMENT

A. Federal

EPA enforces compliance with air quality standards for sulfur oxides, nitrogen oxides, particulate matter, carbon monoxide, hydrocarbons, and photo-chemical oxidants. EPA retains the right to initiate civil action against violators, and to impose fines. In addition, non-complying areas are subject to loss of federal aid. EPA maintains an inspection-testing program to detect violators of federal regulations which restrict industrial and moving vehicle emission regulations.

B. State

State air pollution control commissions may establish state emission regulations which are more stringent than Federal regulations, investigate violations of state regulations, and regulate stationary sources of air pollutants.

C. Regional

Regional agencies generally have no regulatory authority, but may act in an advisory capacity to state and local agencies. They also conduct monitoring operations and report violators.

D. Local

Local governments enact some ordinances limiting types and amounts of emissions (for example, open burning of trash or

leaves), but more often they monitor local air quality to identify violations of state and federal regulations.

V. INFORMATION SOURCES

A. Federal

The Division of Air Quality and the Office of Public Affairs in the Environmental Protection Agency provide general information and publications regarding air quality.

EPA regional offices provide specific information for all issues related to air quality. Separate offices exist for various topics such as air quality, hazardous materials, pollution standards, surveillance and analysis.

U.S. Senators and Representatives have aides who work with air quality issues as they apply to each state.

B. State, Regional and Local

State environmental protection bureaus or natural resources departments usually have air quality divisions, whose offices supply technical information regarding state air quality operations. Some states also have a policy-making group with a title such as "Air Pollution Control Commission" which can supply additional information regarding air quality standards and licensing procedures, as well as descriptions of the designation and development of air quality regions within a state.

Few regional or local air quality organizations exist, but many sources of locally relevant information can be located. Industries, Chambers of Commerce, neighborhood associations, local American Cancer Society or American Lung Association Chapters, and the local weather service are just a few examples of places which can supply information. Additional local sources are suggested in the General Information Section.

WATER QUALITY

I. TOPICS

Wastewater Disposal: Wastewater treatment, sewage system overflows, industrial discharges, urban and agricultural ground water runoff, introduction of hazardous materials into waterways (oil spills, chemical dumpings, etc.).

Waterways: Maintenance and preservation of recreational and wilderness waterways, impact of boating on lakes and streams.

Other: Flooding, drought, watersheds, wetlands, and coastal waters.

II. PLANNING

A. Federal

The Water Pollution Control Act of 1972 (PL92-500) as amended in 1977, contains two sections which are directly responsible for much of the regional water quality planning across the nation. Section 201 provides federal funds for planning wastewater collection and treatment facilities. Section 208 provides federal funds and technical assistance in the development of regional water quality plans. EPA designates those regional agencies eligible for planning assistance.

B. State

State governments, through appropriate legislation, establish most of the planning agencies that deal with preserving and protecting the commercial and recreational value of waters within the state. Many states maintain water quality planning agencies which coordinate federal, state, and local planning efforts, and develop statewide water quality plans.

C. Regional

The majority of specific water quality planning is done by regional agencies, through funding provided by EPA. Many regional agencies establish water quality advisory committees which deal specifically with water quality issues. These committees also obtain the public input required for planning and facilities proposals.

D. Local

Most large municipal areas have water quality plans, formulated in conjunction with state and regional agencies. The majority of local governments have a major role in facilities planning for sewage treatment plants, lagoon systems, etc.

III. ADMINISTRATION - IMPLEMENTATION

A. Federal

Federal agencies (EPA) do not involve themselves to a great extent in the administration or implementation of water quality plans. An exception is the joint administration of planning grants with state and regional agencies.

B. State

Most states administer numerous programs dealing with water quality issues. These programs deal with a variety of topics, ranging from "natural waterways" to pollution monitoring to training and certification of water treatment plant operators. Increasingly, states are being delegated both the approval and oversight responsibilities for federal water pollution control act grants.

Water quality programs require involvement by many state agencies. Their efforts are coordinated by water quality divisions of the state departments of environmental protection or natural resources.

C. Regional

Regional involvement in the administration of water quality plans is advisory. Regional planning agencies work in conjunction with designated local governmental agencies and citizens task forces.

D. Local

A great deal of the administrative and implementation activities are carried out by local government agencies such as road commissions, city and township planning departments, and drain commissioners. Their activities may include the financing, construction and operation of water treatment facilities, sewer and drain system maintenance, the enactment of local ordinances dealing with such issues as waterways development, septic system regulation and recreational restrictions.

IV. REGULATION

A. Federal

EPA has established clean water standards, compliance timetables, and monitoring programs to detect violations of federal clean water standards. The most notable of these include requirements for "best available treatment" of industrial discharge by 1983, and a classification system for coordinating water quality and use. EPA also participates in the National Pollutant Discharge Elimination System (NPDES) program (required by law) which requires waste treatment operations to meet state and federal regulations.

B. State

State water quality departments issue permits under NPDES, and monitor those systems approved by both the EPA and state agencies. Health departments establish safety standards for drinking water, and the conduct mandatory testing procedures to maintain compliance with these standards.

C. Regional

Regional involvement in the regulation of water quality is advisory. The planning agency may recommend local water quality standards, and monitor water quality for state and local government offices.

D. Local

Local governments may establish water quality standards more stringent than federal or state requirements. They can regulate the location of sewage treatment systems and monitor their performance. They may also utilize zoning restrictions to protect waterways, limit development around lakes and streams and establish stringent regulations regarding sewage disposal facilities.

V. INFORMATION

A. Federal

The U.S. Fish and Wildlife Service, U.S. Coast Guard, and U.S. Army Corp of Engineers control hazardous chemical spills, operate dredging projects, regulate Great Lakes and river transportation, monitor water quality in restricted wilderness areas, and operate canal and lock systems in the U.S. Their offices can provide information regarding specific operations in these areas.

EPA's water quality division produces large numbers of publications such as pamphlets and films dealing with specific water quality issues. The regional EPA office can be contacted directly for specific requests. (See General Information Section for addresses of regional EPA offices.)

The Conservation Foundation, in conjunction with the EPA, has run a series of intensive, technical workshops for local government officials and other citizens on the facilities planning stage of the Water Pollution Control Act. They can provide some printed material (including a series of hypothetical community simulation games) and a list of workshop participants that attended from your state. (The Conservation Foundation, 1717 Massachusetts, N.W., Washington, D. C. 20036.)

B. State

The water quality branch of the state environmental protection bureau or department of natural resources will have information regarding both the technical and planning aspects of water quality issues within the state. Public health department offices can supply additional materials regarding floodplains, drainage systems, urban water supply systems and water quality standards.

C. Regional

The Regional Planning Commission is probably the best source for all types of water quality information. They can provide planning goals, maps, names of local organizations that have an interest in water quality, technical information, and other informational materials related to water quality issues.

SOLID WASTE MANAGEMENT AND RESOURCE RECOVERY

I. TOPICS

Solid wastes: urban and rural sanitary landfills, dumps, disposal of hazardous substances, sludge disposal, septic systems, industrial wastes, mining by-products.

Resource recovery: recycling processes, energy recovery, implications of packaging, composting.

II. PLANNING

A. Federal

The Federal Resource Conservation and Recovery Act of 1976 provides financial and technical assistance to states, regional and local governments who wish to establish resource recovery and waste management plans. Support usually takes the form of planning grants, training and demonstration grants, and research and development funds. These functions are the responsibility of the EPA Office of Solid Waste Management Programs. In addition, EPA provides assistance in identifying regions with common waste management problems, and formulates guidelines for state, regional, and local waste management/resource recovery plans.

B. State

State solid waste management and resource recovery planning is usually done within the departments of conservation or natural resources. These offices identify waste management regions within the state and establish state plans for waste management and resource recovery.

C. Regional

Regional agencies establish, review, and/or amend specific regional plans for waste management and resource recovery in cooperation with local governments. They also serve as demonstration agencies, developing new planning concepts for dealing with resource recovery and waste management issues.

D. Local

Drain commissions, county commissions and city departments of public works are involved in the evaluation and planning of resource recovery programs, in conjunction with state and regional agencies.

III. ADMINISTRATION - IMPLEMENTATION

A. Federal

EPA establishes procedures and regulations for identifying and disposing of hazardous materials, mining wastes and other solid pollutants in conjunction with state and local agencies. They also establish and monitor resource recovery and waste disposal techniques and control distribution of planning funds under Section 408 of the Resource Conservation and Recovery Act.

B. State

State agencies coordinate regional efforts within their jurisdiction, regulate or advise local governments on the construction and operation of disposal facilities, and issue licences for the operation of resource recovery systems and wastewater plants. Some states have enacted resource recovery legislation which provides a specific administrative structure to achieve their planning goals.

C. Regional

Regional agencies, depending on their status, administer research and development funds, planning grants, and demonstration projects by assigning planning tasks and funds to appropriate local groups.

D. Local

Most implementation and operation procedures are established by local governments. Counties, townships or cities enact appropriate ordinances which insure compliance with state and federal regulations and construct and operate waste treatment facilities.

IV. REGULATION

A. Federal

EPA monitors urban and industrial waste management operations for compliance with the Resource Conservation and Recovery Act, and issues compliance orders to violators. They are empowered to initiate civil actions for continued violations. EPA has also established regulations for closing most open dumps, or converting them into sanitary landfill sites. Numerous regulatory powers also exist which establish requirements for special hazardous substance disposal sites.

B. State

State regulatory powers vary according to each state's resource recovery legislation, but states may not establish standards which are less stringent than federal regulations. State health departments may operate inspection programs to monitor compliance with sanitation regulations. Conservation or natural resource departments regulate placement and operation of waste management facilities to insure compliance with air quality and water quality regulations, minimize environmental impacts, and make appropriate use of land.

C. Regional

Regional agencies may impose limitations on activities in a few cases, but regional planning councils act mainly in an advisory capacity, recommending standards and regulatory procedures to state and local government agencies.

D. Local

Local government agencies may limit the type, scope, and users of waste management facilities. They also establish regulations regarding storage and disposal practices for urban refuse (including composting materials), septic tank sludge, abandoned vehicles, and most other community solid wastes.

V. INFORMATION

Many regions do not yet have solid waste/resource recovery plans. A great deal of information is available, however, concerning solid waste management planning and practices. Much less information is available concerning resource recovery operations. In addition, the current rate of development of resource recovery technology makes much of this information outdated by the time it is printed.

The best place to obtain current information regarding solid waste management or resource recovery is probably the regional planning commission in your area. Other specific information sources are listed below. General Information may also be obtained from the sources in the next section.

A. Federal

The Federal and Regional EPA Offices of Solid Waste Management deal with most aspects of resource recovery/waste management systems. The U.S. Bureau of Mines controls the use and disposal practices for low-grade mineral resources, mine tailings, and other mining by-products, and should be able to supply information related to those topics.

B. State

State resource recovery commissions, economic expansion committees, health departments, and offices of land resources programs, provide information regarding state goals, planning practices, health standards, licensing procedures and current solid waste management operations.

C. Regional - Local

Waste treatment facilities, landfills, and sewage treatment plants can supply information on specific operating and licensing standards, emergency procedures, plant efficiencies, etc. Recycling centers (usually operated by local environmental groups) may provide current information on local issues and projects. Many industries operate specific resource-recovery programs and are usually quite willing to describe their contribution to regional waste management plans. They can supply economic information (installation and operation costs, savings of materials), descriptions of the conversion of waste materials into useable products, and historical information regarding the establishment of their particular operation. Many plants conduct tours of their facilities.

GENERAL INFORMATION SOURCES

The following is a list of general information sources that can provide information on a variety of environmental planning topics. (More specific information sources are listed at the end of each topic area.) These information sources are presented under two headings: Agencies and Organizations that can provide general information (and possibly pamphlets, etc.) on environmental topics or answer specific questions on (local) environmental issues and Publications that can provide general information on environmental issues or provide lists of relevant agencies and organizations.

AGENCIES AND ORGANIZATIONS

Regional Planning Councils or Commissions

The information office of your regional planning council is the best source of information about regional environmental planning issues. It can provide you with reports on current planning processes, and can guide you to the correct state and local government personnel and interested citizens groups for different environmental issues. It might also provide maps and charts useful for classroom instruction.

In 1979, the National Association of Regional Councils (NARC) directory lists 661 regional councils throughout the United States with 535 being designated as A-95 Clearinghouse agencies. Regional councils vary greatly both in the size of the population they serve and in the size of their operating budgets. They also vary in the number of federal programs for which they are a designated planning agency. Those councils that have been most active (i.e. submitted regional plans in many areas of environmental planning) in each state are listed below. You can obtain the name and address of the regional planning council in your area through your state planning agency or your local govern-

ment officials. (This information is also available in the 1979 Directory of Regional Councils published by the National Association of Regional Councils, 1700 K St., NW, Washington, D. C. 20006.)

The following listing is alphabetical by state.

Birmingham Regional
Planning Commission
2112 11th Ave. S. Suite 220
BIRMINGHAM, ALABAMA 35205

South Alabama Regional
Planning Commission
P.O. Box 1665
250 N. Water St.
MOBILE, ALABAMA 36601

Fairbanks Town & Village
Assoc. for Development
407 Second Ave.
P.O. Box 74080
FAIRBANKS, ALASKA 99707

Maricopa Assoc. of
Governments
1820 W. Washington
PHOENIX, ARIZONA 85007

Pima Assoc. of Govern-
ments
405 Transamerica Bldg.
TUCSON, ARIZONA 85701

Central Arkansas Planning
& Development District
P.O. Box 187
112 Northeast Front St.
LONOKE, ARKANSAS 72086

Southeast Arkansas Economic
Development District
P.O. Box 6806
1108 Poplar St.
PINE BLUFF, ARKANSAS 71601

Association of Bay Area Governments
Hotel Claremont
BERKELEY, CALIFORNIA 94705

Southern California Assoc. of Govern-
ments
600 S. Commonwealth Ave. Suite 1000
LOS ANGELES, CALIFORNIA 90005

Sacramento Regional Area Planning
Commission
800 "H" St., Suite 300
P.O. Box 808
SACRAMENTO, CALIFORNIA 95804

Denver Regional Council of Govern-
ments
2480 W. 26th Ave., Suite 200-B
DENVER, COLORADO 80211

Capitol Region Council of Govern-
ments
97 Elm Street
HARTFORD, CONNECTICUT 06106

Central Naugatuck Valley Regional
Planning Agency
(Council of Governments of the Central
Naugatuck Valley)
20 East Main St.
WATERBURY, CONNECTICUT 06702

Wilmington Metropolitan Area Planning
Coordinating Council
University Off Plaza
Stockton Bldg., S-201
NEWARK, DELAWARE 19702

Metropolitan Washington Council of Governments
1225 Connecticut Ave., N.W.
WASHINGTON, D. C. 20036

West Florida Regional Planning Council
P.O. Box 486
PENSACOLA, FLORIDA 32593

Tampa Bay Regional Planning Council
3151 Third Ave., N., Suite 540
ST. PETERSBURG, FLORIDA 33713

Atlanta Regional Commission
Suite 200, 230 Peachtree St.
ATLANTA, GEORGIA 30303

Coosa Valley Area Planning & Development Commission
P.O. Drawer H, 3 Broad St.
ROME, GEORGIA 30161

Ada Planning Association
150 N. Capitol Boulevard
P.O. Box 500
BOISE, IDAHO 83701

Council of Governments of Cook County
400 W. Madison St.
CHICAGO, ILLINOIS 60606

Greater Wabash Regional Planning Commission
100 S. Court St.
GRAYVILLE, ILLINOIS 62844

Bi-State Metropolitan Planning Commission
1504 Third Ave.
ROCK ISLAND, ILLINOIS 61201

Northwestern Indiana Regional Planning Commission
3149 Kennedy Avenue
HIGHLAND, INDIANA 46322

Michiana Area Council of Governments
1120 County-City Bldg.
SOUTHBEND, INDIANA 46601

Central Iowa Regional Assoc. of Local Governments
104½ E. Locust St.
DES MOINES, IOWA 50309

Siouxland Interstate Metropolitan Planning Council
Box 447
SIOUX CITY, IOWA 51102

Wichita-Sedgwick County Metropolitan Area Planning Commission
455 N. Main
WICHITA, KANSAS 67202

Kentuckiana Regional Planning & Development Agency
505 W. Ormsby Ave.
LOUISVILLE, KENTUCKY 40203

Capital Economic Development District Council
1723 Dallas Dr.
BATON ROUGE, LOUISIANA 70806

Regional Planning Commission for Jefferson, Orleans, St. Bernard and St. Tammany Parishes
333 St. Charles Ave., Suite 900
Masonic Temple Bldg.
NEW ORLEANS, LOUISIANA 70130

Androscoggin Valley Regional Planning Commission
70 Court St.
AUBURN, MAINE 04210

Regional Planning Council
701 St. Paul St.
BALTIMORE, MARYLAND 21202

Metropolitan Area Planning Council
44 School St.
BOSTON, MASSACHUSETTS 02108

Berkshire County Regional Planning Commission
10 Fenn St.
PITTSFIELD, MASSACHUSETTS 01201

Southeast Michigan Council of Governments
Eighth Floor, Book Bldg.
1249 Wasington Boulevard
DETROIT, MICHIGAN 48226

Tri-County Regional Planning Commission
2722 East Michigan Ave.
LANSING, MICHIGAN 48912

West Michigan Shoreline Regional Development Commission
500 Hackley Bank Bldg.
Muskegon Mall
MUSKEGON, MICHIGAN 49440

Arrowhead Regional Development Commission
200 Arrowhead Place
DULUTH, MINNESOTA 55802

Metropolitan Council
300 Metro Square Bldg.
ST. PAUL, MINNESOTA 55101

Gulf Regional Planning Commission
P.O. Box 4206
GULFPORT, MISSISSIPPI 39301

Central Mississippi Planning and Development District
2675 River Ridge Rd.
JACKSON, MISSISSIPPI 39216

Mid-America Regional Council
20 West Ninth St., 2nd Floor
KANSAS CITY, MISSOURI 64105

East-West Gateway Coordinating Council
112 N. Fourth St., Suite 1200
ST. LOUIS, MISSOURI 63102

Billings-Yellowstone City-County Planning Board
Courthouse, Rm. 303
BILLINGS, MONTANA 59101

Omaha-Council Bluffs Metropolitan Area Planning Agency
7000 W. Center Rd.
OMAHA, NEBRASKA 68106

Washoe Council of Governments
2525 Terminal Way
RENO, NEVADA 89502

Southeastern New Hampshire Regional Planning Commission
3 Water St.
EXETER, NEW HAMPSHIRE 03833

North Hudson Regional Council of Mayors
6914 Bergenline Ave.
GUTTENBERG, NEW JERSEY 07093

Middle Rio Grande Council of Governments of New Mexico
Suite 1320
505 Marquette Ave., N.W.
ALBUQUERQUE, NEW MEXICO 87102

Erie and Niagara Counties Regional Planning Board
Northtown Plaza
3103 Sheridan Dr.
AMHERST, NEW YORK 14226

Tri-State Regional Planning Commission
One World Trade Center, 82nd Floor
NEW YORK, NEW YORK 10048

Piedmont Triad Council of Governments
2120 Pinecroft Rd.
GREENSBORO, NORTH CAROLINA 27407

Triangle J Council of Governments
P.O. Box 12276
100 Park Dr.
RESEARCH TRIANGLE PARK,
NORTH CAROLINA 27709

Lake Agassiz Regional Council
P.O. Box 428
319½ 5th St., N.
FARGO, NORTH DAKOTA 58102

Northeast Ohio Areawide Coordinating Agency
1501 Euclid Avenue
CLEVELAND, OHIO 44115

Miami Valley Regional Planning Commission
333 W. First St., Suite 500
DAYTON, OHIO 45402

Toledo Metropolitan Area Council of Governments
Suite 725, 420 Madison Ave.
TOLEDO, OHIO 43604

Association of Central Oklahoma Governments
Suite 200, 4801 Classen Boulevard
OKLAHOMA CITY, OKLAHOMA 73118

Indian Nations Council of Governments
630 W. Seventh St.
TULSA, OKLAHOMA 74127

Lane Council of Governments
North Plaza Level PSB
125 Eighth Avenue East
EUGENE, OREGON 97401

Columbia Region Association of Governments
527 S.W. Hall
PORTLAND, OREGION 97201

Mid Willamette Valley Council of Governments
220 High St., N.E.
Senator Bldg.
SALEM, OREGON 97301

Delaware Valley Regional Planning Commission
Penn Tower Bldg.
1819 John F. Kennedy Boulevard,
Third Floor
PHILADELPHIA, PENNSYLVANIA 19103

Southwestern Pennsylvania Regional Planning Commission
Eighth Floor, Manor Bldg.
564 Forbes Ave.
PITTSBURGH, PENNSYLVANIA 15219

Central Midlands Regional Planning Council
Suite 155, 800 Dutch Square Boulevard
COLUMBIA, SOUTH CAROLINA 29210

South Carolina Appalachian Council of Governments
Drawer 6668
GREENVILLE, SOUTH CAROLINA 29606

South Eastern Council of Governments
208 East 13th St. - P.O. Box 1859
SIOUX FALLS, SOUTH DAKOTA 57101

Chattanooga Area Regional Council of Governments/Southeast Tenn. Development District
413 James Bldg.
CHATTANOOGA, TENNESSEE 37402

Mid-Cumberland Council of Governments and Development District, 501 Union St. Suite 600
NASHVILLE, TENNESSEE 37219

North Central Texas Council
of Governments
P.O. Drawer COG
ARLINGTON, TEXAS 76011

South East Texas Regional
Planning Commission
P.O. Drawer 1387
NEDERLAND, TEXAS 77627

North East Texas Economic
Development District
P.O. Box 1967
TEXARKANA, TEXAS 75501

Mountainland Associaton of
Governments
160 East Center
PROVO, UTAH 84601

Six-County Commissioners
Organization
Sevier County Courthouse
P.O. Box 191
RICHFIELD, UTAH 84701

Southern Windsor County
Regional Planning and
Development Commission
Community Center, Rm. 18
SPRINGFIELD, VERMONT 05156

Southeastern Virgina Planning
District Commission
16 Koger Executive Center
NORFOLK, VIRGINIA 23502

Crater Planning District
Commission
P.O. Box 1808
PETERSBURG, VIRGINIA 23803

Puget Sound Council of
Governments
216 First Avenue South
SEATTLE, WASHINGTON 98104

Regional Planning Council of Clark
County
P.O. Box 5000
1408 Franklin St.
VANCOUVER, WASHINGTON 98663

Regional Intergovernmental Council
Suite 908 Stanley Bldg.
1426 Kanawha Boulevard, East
CHARLESTON, WEST VIRGINIA 25301

Dane County Regional Planning
Commission
Rm. 312 B, City-County Bldg.
MADISON, WISCONSIN 53709

Southeastern Wisconsin Regional
Planning Commission
916 N. East Avenue
P.O. Box 769
WAUKESHA, WISCONSIN 53186

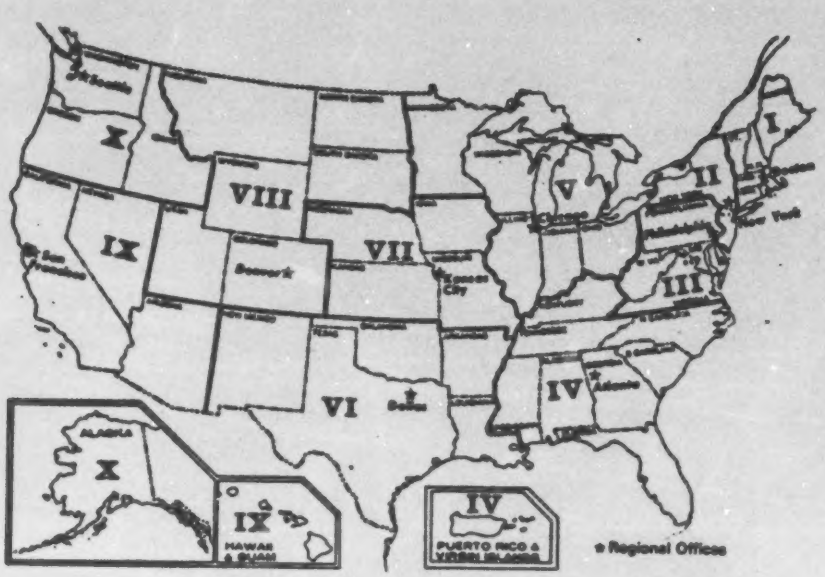
Lincoln-Uinta Association of
Governments
P.O. Box 389
KEMMERER, WYOMING 83101

EPA

The Environmental Protection Agency can provide general and technical information on air, water, solid waste and other environmental problems. The following chart illustrates the organizational structure of the EPA and should help you to determine the relevant sub-agency for your needs.

ENVIRONMENTAL PROTECTION AGENCY
ADMINISTRATOR
DEPUTY ADMINISTRATOR
OFFICE OF ADMINISTRATIVE LAW JUDGES
OFFICE OF CIVIL RIGHTS
OFFICE OF FEDERAL ACTIVITIES
OFFICE OF GENERAL COUNSEL
OFFICE OF INTERNATIONAL ACTIVITIES
OFFICE OF LEGISLATION
OFFICE OF PUBLIC AWARENESS
OFFICE OF REGIONAL AND INTERGOVERNMENTAL OPERATIONS
ASSISTANT ADMINISTRATOR FOR PLANNING AND MANAGEMENT
OFFICE OF ADMINISTRATION
OFFICE OF PLANNING AND EVALUATION
OFFICE OF RESOURCES MANAGEMENT
OFFICE OF AUDIT
ASSISTANT ADMINISTRATOR FOR ENFORCEMENT
OFFICE OF GENERAL ENFORCEMENT
OFFICE OF WATER ENFORCEMENT
OFFICE OF MOBILE SOURCE AND NOISE ENFORCEMENT
ASSISTANT ADMINISTRATOR FOR WATER AND HAZARDOUS MATERIALS
OFFICE OF WATER PLANNING AND STANDARDS
OFFICE OF WATER PROGRAMS OPERATIONS
OFFICE OF WATER SUPPLY
OFFICE OF SOLID WASTE
ASSISTANT ADMINISTRATOR FOR AIR AND WASTE MANAGEMENT
OFFICE OF AIR QUALITY PLANNING AND STANDARDS
OFFICE OF MOBILE SOURCE AIR POLLUTION CONTROL
OFFICE OF NOISE ABATEMENT AND CONTROL
OFFICE OF RADIATION
ASSISTANT ADMINISTRATOR FOR RESEARCH AND DEVELOPMENT
OFFICE OF MONITORING AND TECHNICAL SUPPORT
OFFICE OF ENERGY, MINERALS AND INDUSTRY
OFFICE OF
IR, LAND AND WATER USE
OFFICE OF HEALTH AND ECOLOGICAL EFFECTS
ASSISTANT ADMINISTRATOR FOR TOXIC SUBSTANCES
OFFICE OF PESTICIDE PROGRAMS
OFFICE OF CHEMICAL CONTROL
OFFICE OF TESTING AND EVALUATION
PROGRAM INTEGRATION AND INFORMATION
REGIONAL OFFICES
REGION I Boston
REGION II New York
REGION III Philadelphia
REGION IV Atlanta
REGION V Chicago
REGION VI Dallas
REGION VII Kansas City
REGION VIII Denver
REGION IX San Francisco
REGION X Seattle

The following is a map of the ten EPA regions and a listing of the regional offices.



U.S. EPA REGIONAL OFFICES

REGION 1

John F. Kennedy Federal Bldg.
Room 2203
Boston, MA 02214
(617) 223-4704

REGION II

26 Federal Plaza
Room 1009
New York, NY 10007
(212) 264-2515

REGION III

Curtis Bldg.
6th and Walnut Sts.
Philadelphia, PA 19106
(215) 597-9370

REGION IV

1421 Peachtree St., NE
Atlanta, GA
(404) 526-3004

REGION V

230 S. Dearborn St.
Chicago, IL 60604
(312) 353-2072

REGION VI

First International Bldg.
1201 Elm St.
Dallas, TX 75270
(214) 749-1962

REGION VII

1735 Baltimore St.
Kansas City, MO 61408
(816) 374-5894

REGION VIII

1860 Lincoln St.
Denver, CO 80203
(303) 837-4905

REGION IX

100 California St.
San Francisco, CA 94111
(415) 556-6266

REGION X

1200 6th Ave.
Seattle, WA 98101
(206) 442-1203

State Governments

The state governments generally have one or two departments concerned with environmental planning problems (called The Department of Natural Resources, Environmental Protection, Conservation, etc.). A state general information office, the Governors office, or your regional planning council can direct you to the correct sub-agency or bureau.

Congressmen and Legislators

Senators, Congressmen and state legislators generally have aides assigned to environmental issues who can provide information on local issues or recommend which people to call at the federal, state or local level to answer your questions. State representatives can often obtain information from the governmental bureaucracy more quickly and more successfully than individuals. Congressmen generally maintain local or district offices which are listed in local telephone books.

Cooperative Extension Agencies

The Cooperative Extension Service (generally located at a land grant university but with a system of local extension agents) can sometimes provide technical information concerning environmental conditions in your area.

News Media

Local newspapers, radio and television newsrooms can sometimes supply information about current local environmental issues. Newspaper files organized around specific organization names or issues can provide historical or background information on local problems.

Public Interest Groups

Many public interest groups are actively involved in regional and local environmental planning issues; some of these groups are local chapters of national or state organizations. Other groups are organized locally, for a specific purpose; the more active of these groups receive frequent publicity from local radio and television stations, newspapers, weekly journals, and locally published magazines. Active interest groups can also be identified by regional planning councils, chambers of commerce, and by citizens who attend public meetings regarding environmental planning issues.

Below is a list of national organizations which are involved in environmental planning issues and which maintain a network of local chapters.

American Planning Association, 1313 East 60th St., Chicago, IL 60637 also has regional and local chapters throughout the country. It publishes planning advisory service reports and Planning magazine.

*Center for the Study of Responsive Law, P.O. Box 19367, Washington D. C. 20036. A research organization working with public interest, including problems of the environment. Publishes research reports from the Ralph Nader Study Groups.

*Source of all of the following descriptions of environmental organizations: G. Tyler Miller, Jr. Living in the Environment: Concepts, Problems, and Alternatives. Wadsworth:Belmont California, 1975.

The Conservation Foundation, 1717 Massachusetts Avenue N.W. Washington, D. C. 20036. Active in conservation, analysis of the ecological impact of foreign aid, and conservation education in the schools. Publishes CF Newsletter.

Common Cause, P.O. Box 220, Washington, D. C. 20004. One of the most important citizen groups in the country with over 100,000 members which lobbied hard on a broad range of political issues.

Environmental Action, Inc., 2000 P Street N.W., Washington D. C. 20036. Nonprofit organization that evolved from Earth Day 1970. Lobbies for effective legislation for environmental reform. Publishes Environmental Action.

Environmental Defense Fund, Inc., 162 Old Town Rd., East Setauket, New York 11733. A public benefit organization comprised of scientists, lawyers, and laymen that works to link law and science in defense of the environment in court and before regulatory agencies. Other offices at 645 Madison Ave., New York, NY 10022; 1712 N Street N.W., Washington, D. C. 20036; and 2827 Durant Avenue, Berkeley, California 94720.

The Environmental Law Institute, Suite 614-E, 1346 Connecticut Ave. N.W., Washington, D. C. 20036. The Institute, a joint project of The Conservation Foundation and the Public Law Education Institute, conducts a wide program of research in environmental law.

The Izaak Walton League of America, 1326 Waukegan Rd., Glenview, Illinois 60025. A membership organization with local chapters and state divisions. Promotes conservation of renewable natural resources and development and protection of high quality outdoor recreation opportunities. Monthly magazine.

League of Women Voters of the United States, 1730 M Street N.W., Washington, D. C. 20036. An outstanding membership organization with local and state leagues working for political responsibility through an informed and active citizenry. Played a central role in bringing water pollution to the public's attention. Publications on political and environmental issues.

National Audubon Society, 1130 Fifth Avenue, New York, N.Y. 10028. Operates 40 wildlife santuaries across the country and provides a wide variety of ecology education services. Publishes Audubon, Audubon Field Notes.

National Wildlife Federation, 1412 16th St. N.W., Washington, D. C. 20036. Encourages citizen and governmental action for conservation. Publishes a comprehensive conservation directory annually at $1.50 a copy and National Wildlife.

The Nature Conservancy, 1522 K St., N.W., Washington, D. C. 20005. A membership organization with state chapters seeking to preserve natural areas. Often acquires endangered property and holds it for later resale to public agencies.

Resources for the Future, 1755 Massachusetts Avenue N.W., Washington, D. C. 20036. Conducts programs of research and education in development, conservation, and use of natural resources and on quality of the environment through its own staff and through grants to other institutions. Publishes Resources.

Sierra Club, 1050 Mills Tower, San Francisco, California 94104. Membership group devoted to protection of the nation's scenic resources. Provides films, manuals, exhibits, and speakers; publishes books and a monthly bulletin. Sierra Club's Washington Office is an effective lobbying operation.

Soil Conservation Society of America, 7515 Northeast Ankeny Rd., Ankeny, Iowa prepares a monthly journal and various publications on environmental matters.

PUBLICATIONS

EPA

The Environmental Protection Agency publishes a Groups That Can Help directory (EPA Public Inquiries: Office of Public Affairs,

Washington, D. C. 20460). It also publishes regionally based Environmental Hotline directories listing all federal, state and local government environmental offices and most locally organized citizens environmental groups. They also provide a variety of publications on environmental issues. The regional offices for EPA are listed on page 67.

Government Manual

The U.S. Government Manual describes the organization of federal departments and agencies (e.g. Department of Interior, HUD, EPA) and gives addresses from which information about the agencies can be obtained. This manual is generally available from the Reference Desk of a local library.

U.S. Printing Office

The U.S. Government Printing Office provides a monthly catalog of publications by all government agencies and supplies many of these publication for free. The catalog is generally available in libraries or may be obtained by writing to the Superintendent of Documents, U.S. Printing Office, Washington D. C. 20402.

Environmental Quality

The Council on Environmental Quality publishes a yearly Environmental Quality Report which describes current federal legislation and action regarding environmental and social issues and reports the state of the nation with regard to these issues. It has also published a pamphlet on Community Action for Environmental Quality, available through the Government Printing Office.

The Environmental Reporter (Published by the Bureau of National Affairs)

This is a group of reference books which contains all federal and state laws and regulations concerning environmental topics, court decisions on environmetnal questions and in-depth research monographs in areas of environmental concern. Copies of actual laws and regulations related to environmental planning issues are also available through your local congressmen, legislators or library.

The Book of the States (A bi-yearly publication)

This book summarizes the organization of state governments and compares their responses to federal legislation in such areas as housing, transportation, and environmental issues. (Library reference book.)

State Manuals

State manuals, which are generally available in libraries, explain the duties, the organization and the names of the department heads of different state departments and commissions.

National Association of Regional Councils

The National Association of Regional Councils provides a directory of regional planning councils (see page 61) and also publishes several newsletters (i.e. From a Regional Perspective, Washington Report, Water Quality Report, Air Quality Report) concerned with recent federal actions and regional issues. These are frequently available through your regional planning agency or write:

National Association of Regional Councils
1700 K St. N.W.
Washington, D. C. 20006

A Guide to Citizen Participation in Environmental Action

This book can be obtained from the Regional Planning Association of Southern California, 621 South Virgil Ave., Los Angeles, CA 90005.

Council of Planning Librarians Bibliographies

The Council of Planning Librarians publishes bibliographies on a variety of planning subjects that are available at larger libraries.

7'80.

Conservation Directory

The National Wildlife Federation (1412 16th Street NW, Washington, D. C. 20036) publishes a directory of international, national, and state organizations concerned with environmental and conservation issues.

Bibliographic Materials on Environmental Affairs

This bibliography presents a comprehensive list of environmental periodicals. It is available free from The Anderson Foundation, 600 Fifth Ave., New York, N.Y. 10020.

PART III

AN 'URBAN TRAIL' AS AN INTRODUCTION TO ENVIRONMENTAL PLANNING EDUCATION

By

Ursula Frischknecht
Kurt Frischknecht

CHAPTER 1 - RATIONALE

The following unit is an example of how to relate environmental planning processes to practice. There is evidence that children have little knowledge of their community outside their living area, shopping streets, and sportsgrounds. Usually, children are not encouraged to explore their urban environment, but when directly confronted with positive as well as negative aspects of their community they become more sensitive and responsive to their surroundings. Subsequently, children develop an increased understanding of how a community has evolved and is likely to change in the future, and they are more inclined to effect their responsibility towards the environment in which they live.

Therefore, emphasis is laid on the following educational elements:

-awareness
-understanding
-appreciation (critical appraisal)
-motivation to action

A study of the environment should never be restricted to the classroom; the interdisciplinary subject matter of environmental planning is especially well suited for field studies. Students should have the opportunity to be confronted with real-life situations in order to understand the temporal and spatial mechanisms underlying the natural and man-made environment. As an introduction to the planning process and as a stimulant to further investigations we have developed a framework for an "Urban Trail"; this idea, as opposed to the well-known nature trails, had emerged about 8 years ago in Great Britain where it is known as a 'Town Trail.' An 'Urban Trail' can be defined as a guided tour through a section of the community in which the urban tracker can identify the basic parts of an urban setting and can observe and compare many different aspects of the environment as they are related to environ-

mental planning processes. The necessary support in defining all the important factors of the environment is given in Figure 1.

Today planning no longer has the physical environment as the sole object of study. The social, political, legal, economic, managerial, and other processes and disciplines which determine the functions and inter-relations of society are equally fundamental to environmental planning studies as those traditionally associated with planning, such as surveying, engineering, and architecture.

The circumstances under which the Urban trail is set and the focal points to be investigated are entirely dependent upon the interests of teachers and the children involved. The guidelines traced in this paper are meant to be suggestions of a rather general character, rather than being binding on a specific community. The teacher may wish to give the students an overview of the planning process through several decades by designing the trail across the old and modern parts of the setting. Alternatively, the teacher may prefer to study some particular setting, thereby giving emphasis more to the functional aspects of the urban environment which comprise residential, commercial, industrial, and open-space aspects. However the trail is used and adapted to personal needs we hope that it will encourage the urban tracker to take a closer look at all the factors and forces which determine the total environment and influence their lives.

CHAPTER 2 - GOALS AND OBJECTIVES OF THE 'URBAN TRAIL' PROJECT

The overall idea of the Urban Trail can be stated as:

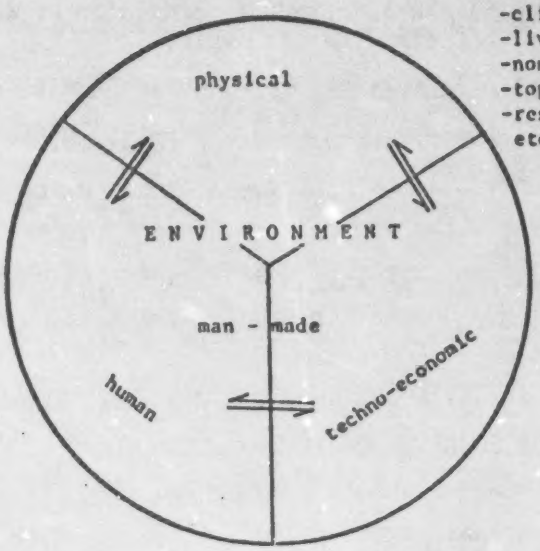
- Urban Trails are meant to be enjoyed
- Urban Trails are laid out to initiate interest in local planning and development
- Urban Trails' primary purposes are educational.

The Urban Trail project is specifically aimed at stimulating, both in and outside the school, a students'

- awareness of their own immediate natural and man-made environment, in an area of human settlements,
- familiarity with the urban environment

Physical Environment: ◀ Natural systems

- -land, water, air
- -climate
- -living (biotic) factors
- -non-living (abiotic) factors
- -topography, soils, geology
- -resources
- etc.



Human Environment:

◀ Shelter systems

- -housing
- -community facilities
- -city centers
- etc.

◀ Individual systems

- -physiological needs (food, fiber, fuel)
- -psychological needs (safety and security; affection, belonging; esteem, self-realization; knowledge and esthetics)
- etc.

◀ Social systems

- -social relations, social hierarchy
- -social values, morals, and ethics
- -public administration and law
- -politics (decision-making processes, influences)
- -economic development
- -health and welfare, population trends
- -cultural patterns
- -esthetic resources and recreational facilities
- -educational systems
- etc.

Techno-economic Environment:

◀ Network systems.

- -physical layout (plan)
- -transportation systems (road, air, rail)
- -public utility systems (water, power, sewerage)
- -communication & information systems (TV, radio, telephone, computer, news service)
- etc.

◀ Supply systems

- -goods and service production
- -shopping areas and malls
- etc.

Fig. 1. The 'total environment' in an urban setting.

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- understanding the man-made environment in terms of its 'being-like-it-is' or 'not-being-as-it-should be'
- confrontation with real life situations and problems
- sensing the spectrum of opinion about one controversial subject within their urban community
- critical appraisal of the urban environment.

Experiencing and attempting to explain the man-made and natural environments will help students become aware of the need to treat the environment with respect. Additionally, this experience may initiate a student's willingness to play a part in environmental planning and alleviating problems through laws, public policy, and active participation.

The specific educational objectives for the environment with the support of an Urban Trail are not elaborated here; instead it is intended that the teacher should develop specific objectives himself by referring to personal or local interests. However, one objective - independent of the specific content of the Urban Trail - is an "umbrella" to the other objectives.

- ethics esthetics, language: the student develops personal emotions and habits reflecting a caretaker responsibility towards the environment and communicates his feelings to others. He evolves an esthetic appreciation of the natural and built environment in which he lives and visits.

CHAPTER 3 - REALIZATION OF AN URBAN TRAIL

The general concept of an urban trail is best captured in the discussion of town trails by Wheeler and Waites (1972):

> "The length of the Town Trail depends on the number and variety of visual experiences to be included. Contrast, juxtapositions and surprises are essential to the success of the Trail. Do not lead the Trail along the obvious route, but deviate; find out unusual pathways; do not stick to the 'beaten track'; go through controversial areas where the planner or developer may be in conflict with the public over the use of a particular site. Take the Trail through environmentally 'negative' as well as environmentally 'positive' parts of the city because what might be soothing to one eye might be an eyesore to another."

For the particular set-up of the trail the teacher may proceed according to the following steps:

1) Walk through your community by consulting the checklist (described in Chapter 4) to discover the relevant features of the urban environment in which you live.

2) With the help of the "Point of Interest Matrix" (Chapter 5) decide the parts on which to focus according to your own references or to impending problems in your community.

3) Develop questions for each point of interest which lead to different activities carried out by the children on the spot (handouts!). Two elaborated examples are provided in Chapter 6. Allow for the greatest possible variety of skills to be performed as they are listed on the activity-side of the matrix.

4) Copy or draw a map on which the locations of interest are connected by a track. Consider that the walk should be comfortable and not more than two miles long in order to give the children enough time for the activities that follow.

Note: ·Be careful not to formulate the questions in a suggestive way which could prevent children from expressing their own feelings and thoughts

·in choosing the activities, consider the age and skill level of your students.

For the implementation of the trail the following procedure is suggested:

1) Split the class into small groups.

2) Recruit the help of other adults who accompnay the groups and are able to answer questions spontaneously arising.

3) Provide the groups with maps and each student with writing materials or handouts for the Urban Trail.

4) Ensure that the children make a note of all their perceptions and observations in order to have a starting point for evaluation and further study in the classroom.

Activities Carried Out In the Classroom

After tracking the trail, talk with the students to identify their particular areas of interest and their needs; this discussion may then lead to further activities and extended studies within the community. Choose problem areas so that the students become aware that their lives are being affected directly if they discount the existence or significance of the problem; this approach should enhance motivation. All classroom activities should ultimately lead to an action in order to obtain more information on a specific issue; for example talk to a local resource person, such as a planner, politician, or senior citizen or help solve an identified problem by writing a letter to local authorities, or by seeking information from parents.

The two examples from our fictitious Urban Trail (Chapter 6) suggest ways in which investigations and activities can be carried out. Try to trace all studies back to the following important questions:

·Where does the scope of responsibility of planning lie in this particular problem?

·As a citizen what can I do to influence the planning process or the decisions made in my community?

CHAPTER 4 - A CHECKLIST AS AN INSTRUMENT FOR 'PROBING THE POTENTIAL OF OUR OWN IMMEDIATE ENVIRONMENT AS A RESOURCE FOR LEARNING'

Purpose of the Checklist

The following checklist is composed of a variety of questions all related to the manifold ramifications of the total environment as depicted in Figure 1. Walking through the community, the teacher should be able to recognize the potential value of the community for educational purposes; primarily this can be accomplished by allowing for experiences, and for recording the diversity of the students' own immediate environment.

How To Use the Checklist

The checklist or inventory list of the environment is useful for two different approaches characterizable by the underlying concepts:

- Concept 1: 'Knowing the Environment' (e.g. school surroundings or downtown)
- Concept 2: 'Learning the Environment from a Certain Aspect' (e.g. history and planning of the community or planned nature in an urban area)

Therefore, we suggest that the teacher select one of these approaches and read the checklist carefully from the chosen conceptual view-point before actually walking through the most feasible area. Whenever the teacher notices a site with an interesting feature that is coincident with one of the questions on the checklist, he should mark this on the appropriate list and include a short specification of the site. Since it is hardly possible to set out in the checklist all the facts and issues to be discovered in a particular community the teacher should only include prominent features he detects on his walk. Only through critical use and personal alertness will this checklist prove fertile!

CHECKLIST

(1) NATURAL SYSTEMS

1. Plants: Do any plants/ trees/shrubs grow in the surroundings? (growing wild - artificially planted)
2. Animals: Do animals live in the soil, on plants, on trees, etc.?
3. Land Elements: What kind of natural land elements can you recognize? (e.g. meadow, lawn, woods, river, ponds, vacant lots, parks.)
4. Topography: Where and how is the natural topography of the land changed? (e.g. bridge, overpass, underpass)
5. Resources: Can you locate sites where resources are utilized? (e.g. food in gardens, wood, recreational land)
6. Water: In what form do you encounter water in your community and what is it used for?
7. Materials: What kind of dead and inanimate materials can you find on the grounds? (Where? Why?)

For further questions related to the natural elements in an urban environment see 2-2, 2-3, 2-4, 3-2, 7-1, 7-2, 7-3, 7-4, 7-8.

(2) NETWORK SYSTEMS

1. Man-made Elements: What different types of artificial landscape elements can you recognize? (e.g. streets, pavements, buildings, parking lots)
2. Ground: What types of cover do you find? (e.g. lawn, bare soil, concrete pavement)
3. Land Use: What types of land use do you detect? Some examples are residential areas, industrial areas, commercial areas (including shopping areas), open space (unused land, park &

recreation areas, play and athletic grounds, parking lots, etc.), cultivated areas (garden plots, community gardens, farming areas, woodlots, etc.), and others such as cemeteries.

4. Unused Sites: Can you find - dilapidated and/or abandoned structures?
   - vacant lots in unsanitary/ sanitary conditions?
   - open land, unplanted (such as unsurfaced playgrounds and playfields and plowed unplanted farm land)?

5. Physical Layout: Is there a site (outlook point on the top of a tall building, or a hill) where one can easily recognize the city design in terms of being linear, grid, vertical or satellite?

6. Transportation: What type of transportation (including mass-transportation systems) exist in the border of your walk? (e.g. pedestrian, bike, automobile, buses, trains.)

7. Conveniences: Are there other types of conveniences constructed for you besides those for cars? (e.g. sidewalks, pedestrian zones, bike routes, lightening conductors.)

8. Traffic Safety: What facilities exist for traffic safety? (i.e. physical protection from trains, street traffic, and pedestrian hazards; traffic signals.)

9. Street Names: What are the names of the streets, public places, points, etc? (origin of names?)

10. Sanitary Installations: Are sanitary installations visible? (e.g. sewerage, point source for dumped watercourses, sewage treatment plant, fire hydrants.)

11. Refuse: What kind of refuse disposal can you detect? (e.g. proper, improper, storage of miscellaneous refuse such as kitchen waste, paper, cans, bottles, garbage, junk, rubble).

12. Economical Growth: Is there a site where patterns of (recent) economical development are identifiable? (e.g. construction sites of a shop, parking ramp, administration building; new buildings, restorations.)

13. Communication/Information: Identify a suitable site where a concentration of information and communication devices is evident. (e.g. telephone box in an area with heavy outdoor advertising, mailbox.)

For related questions see 1-4, 3-2, 6-3, 6-4, 6-5, 7-2.

(3) SUPPLY SYSTEMS

1. Shopping: Are there shopping facilities along your walk?

2. Land Use: Is there a special pattern of land use within these shopping areas? (e.g. wastage of land: huge parking lots, extensive road network; influence on land-use-pattern in the immediate neighborhood, esthetic considerations.)

3. City Center: Can you allocate a center in the downtown area? (Identify components, services, special features)

4. Commerce: What type of commerce are within your walk? (e.g. warehouses, retail stores of various types, food stores, bars and taverns, recreation centers, garages.)

5. Services: What kind of service-rendering enterprises do you meet in your surrounding? (e.g. post office, banks, laundries, information center, guidance office.)

6. Industry: What types of industry are within the boundaries of the community/your walk? (e.g. Processing, manufacturing, storage, servicing, repair)

For related questions see 1-5, 2-3, 2-5, 2-6, 2-12, 5-4, 6-4, 7-1, 7-9.

(4) SHELTER SYSTEMS

1. Housing: What types of housing can you detect on your walk? (e.g. single family houses, apartment buildings, mobile homes.)

2. House Quality: Are there any residential areas where adjacent houses have good and bad exterior maintenance?

3. Privacy: How is privacy achieved in residential areas? (e.g. type and density of houses, backyards and gardens; shielding of visibility and noise.)

4. Community facilities: Are there special community facilities? (What type, function, where?)

For related questions see 2-3, 2-7, 3-3, 6-1, 6-5, 6-6, 7-6.

(5) INDIVIDUAL SYSTEMS

1. Relativeness of Perception: Is there a suitable site where students could be asked to describe/record their feelings about what they can perceive with all their senses within their immediate horizon? (e.g. park, busy crossroad.)

2. Needs: Are there places where you could realize psychological needs such as knowledge and self-actualization? (e.g. school, instruction centers, craft leisure-time centers, facilities for recreational activities, library.)

3. Needs: Do you miss anything when walking along your way?

4. Needs: Do you miss anything when you are in the downtown area? (e.g. parks, cleanliness, art galleries, kind of people, architecture, entertainment, bike routes.)

For related questions see 1-1, 1-2, 2-7, 3-1, 3-5, 4-3, 6-6.

(6) SOCIAL SYSTEMS

1. Social Interaction: Are there any facilities which help people in contacting each other and support involvement in community social interaction? (e.g. public meeting places, sidewalks and pedestrian streets, benches and/or outdoor tables, night lighting, distance between houses, distance house is set back from road, restaurants.)

2. Well-being: Are there any facilities serving the personal/general health and well-being? (e.g. hospitals, parks for recreation, drinking fountains, benches, facilities for handicapped people.)

3. Ethnicity: Do you recognize areas where people of different ethnic affiliation are clustered together?

4. Policies: Can you detect any sign in your area which represents the current political trend of your local government? Some examples are forced economical/industrial development (e.g. parking ramps or lots), emphasis on social institutions (e.g. "day care" center), recreational facilities, improvement of environmental quality (e.g. planting of plants, trees, pedestrian areas.)

5. Restrictions: Are there visible signs of restrictions (law reinforcements) and controls? (e.g. fences, walls, prohibitive signs.)

6. Security/Crime: What kind of safety facilities can be found? (e.g. night lighting, police patrol car, community safety patrol car.)

7. Recreation: What kind of recreational facilities are to be found within your community? (e.g. for swimming, boating, picnicking, camping.)

8. Territoriality: Do you percieve evidence of citizens' concern in local streets and neighborhoods? (Hints: look for paths, sidewalks, benches, fountains in public areas, etc.)

9. Interviewing: Is there a site along your route which would be suitable for interviewing people about a good/bad example of planning? (e.g. a place where students might ask adults about a disputable (beautiful-ugly) facility such as a building or a shopping area)

For related questions see 2-9, 2-12, 2-13, 3-1, 3-5, 5-3, 5-4, 7-6.

(7) QUALITY OF SYSTEMS

1. Air: Can you feel differences in the quality of air by using all your senses at two different places?

2. Water: How clean are the waters in your community (use of all senses)?

3. Noise: What kind of noises can you identify (where, why)?

4. Smell: What kind of smells can you perceive (where, why)?

5. Impact: Is there a good place to observe the impact of people on the environment? That is, how do people use and influence the environment? (e.g. refuse disposal, building site location.)

6. Urban Life Quality: Are there any specifically interesting features along your walk?

architectural	(e.g. special construction or materials)
historical	(e.g. old house with date of construction)
esthetic	(e.g. especially ugly front with peeling paint, sculpture over the main entrance)
locational	(e.g. well-kept family house in front of a noisy plant or street, playground behind the house)

7. Attractiveness: Do you notice certain places especially attractive/unattractive regarding esthetic quality, cleanliness, traffic intrusion, accumulation of junk and/or rubble, etc.?

8. Scenic Quality: Are there any sites with scenic qualities?

9. Ambient Comfort Contrast: Do you have two adjoining sites with contrasting ambient comfort? (e.g. park - noisy street)

For related questions see 2-7, 2-10, 4-2, 6-1, 6-6, 6-7

CHAPTER 5 - INSTRUCTIONS FOR DEVELOPING A 'POINT OF INTEREST MATRIX'

We suggest a technique whereby the stopping points for activities along the Urban Trail are identified from the environmental features found in your community and/or according to your specific interests.

Procedure:

1. Focus on the key issues in your community and mark them in the appropriate boxes (Figure 2), or

   Choose the topics in the 'features' column which you would like to deal with in more detail and mark them in the boxes (Use your own personal preference or help from students.)
   Draw a horizontal line from each marked box (= zone of interest).

2. Try to create a meaningful and relevant task by combining the various aspects of a 'feature' in consideration of a 'street activity' (refer to intersection · in matrix): Be guided by your own interest and be influenced by your knowledge background, the actual issues, and suggestions in reference materials such as books and journals. In other words, decide what will be the content of the task, given your interest and creativity.

3. A different approach to that described is to define one or several broad or narrow objectives in advance (see reference materials Chapter 6.4 and 7.2, or develop your own) such as:

   - The student will be able to identify the diversities and the relationships between the urban elements (broad).

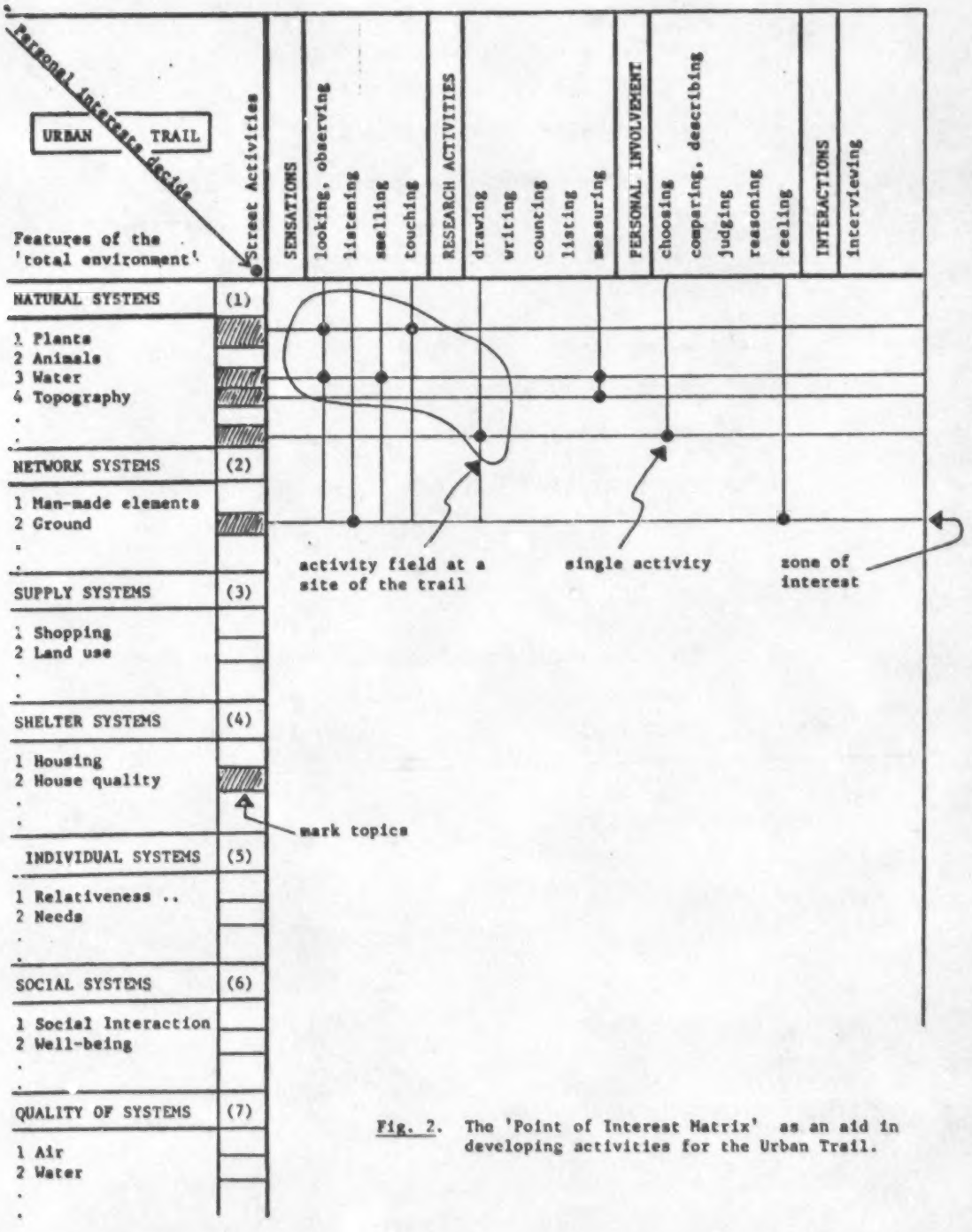


Fig. 2. The 'Point of Interest Matrix' as an aid in developing activities for the Urban Trail.

-The student will be able to identify the basic parts of the city/community, recognize important aspects of planning in a city, and show how the city is dependent on the environment outside the city (broad).

-When presented with a particular biological or social need of man, the student will be able to name several buildings, institutions, structures, or locations where this need is provided by the student's environment (narrow).

Avoid being too confined to your personal educational background when you select possible activities!

4. Write each desirable activity down on a sheet of paper.

5. Try to combine different activities on one or several topics which can be adequately dealt with from one single site on the Urban Trail; this yields the activities carried out at one single stopping point (activity field, see Figure 2).

6. From the identified 'activity fields' select as many as is reasonable, given the time and distance constraints of the Urban Trail.

CHAPTER 6 - SAMPLE ACTIVITIES

6.1 Sample Activity 1

The following example is an elaboration of either catchword 'Transportation' (# 2-6) or 'Commerce' (# 3-4) of the Checklist.

6.1.1 Work on the Trail

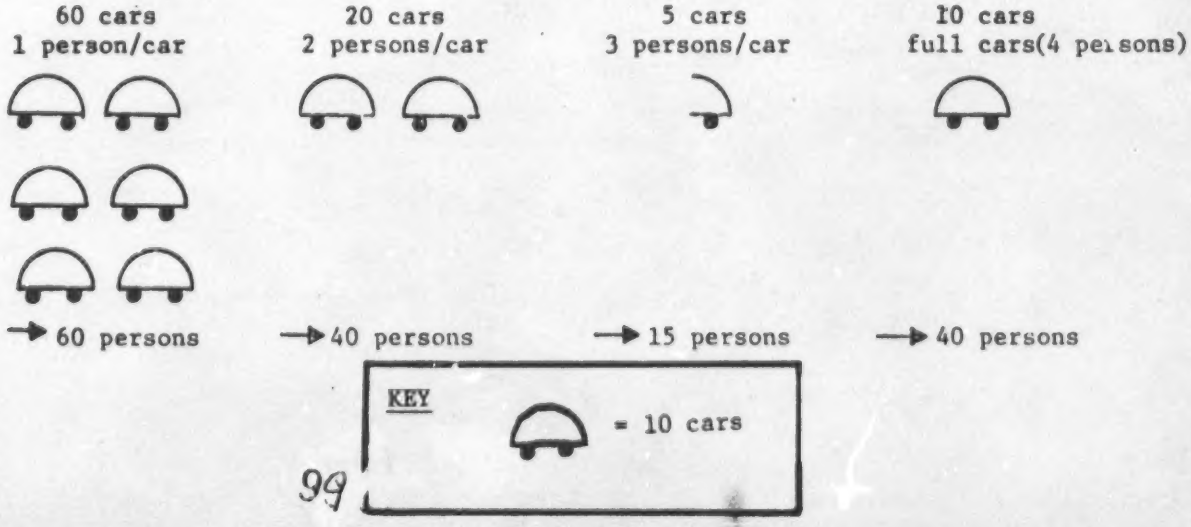
... The trail now leads us in front of a gas station at a busy road.

Tasks:

- Count the cars which pass within five minutes in both directions.
- Count the number of persons in each car and figure out the average number per car.
- Count the cars stopping at the gas station. How much gasoline (regular and unleaded) did they consume? Ask the drivers about the gas/mileage ratio of their cars.
- Close your eyes for two minutes and use the other senses. Write down six words that describe your sensations.

6.1.2 Work in the Classroom and Further Activities

- List the sensations of the students, mark them with + (good) or - (bad) signs; try to find out what caused the positive and negative feelings.
- Let students collect newspaper articles which deal with oil shortage and gas prices. Discuss these issues.
- Illustrate the passenger/car ratio in a simple graph as follows:



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- How many full cars are needed to transport all these people? (40)
- How many buses are needed to transport all these people if each bus carries 40 persons? (4)
- What consequences would carpooling/busing have on the thoughts and sensations reported? (e.g. decreasing noise, less air pollution)
- Where do you think all these people drove? (e.g. shopping, work, physician, visiting friends).
- Why did they take the car? (e.g. dangerous to walk, far away, more comfortable)
- Discuss how planning decisions affect the behavior towards the use of transportation systems (e.g. shopping centers built miles away from residential areas, inconvenient bus schedule, unreflected habits.)
- Find out ways to improve the situation and discuss your solutions with your family (e.g. shopping only once a week, shopping with a neighbor in one car, improving mass transportation, taking the bike for a short trip; for older students: survey about people's attitudes towards mass transportation which could lead to a letter to local authorities).

6.2 Sample Activity 2

The following unit is an elaboration of the catchwords 'Housing' (# 4-1) or 'Urban Life Quality' (# 7-6).

6.2.1 Work on the Trail

The trail leads the group through a residential area with middle class houses. At the point on the map which says 'Stop', students examine the two houses on either side of the street.

Questions on the Spot:

- From what materials are these houses built?
- Would you like to live here? Why? Why not?
- What do you like about this location?
- What don't you like about this location?

- Would you like to play here?
- Can you play all the games you usually play? If not, what can't you play?

6.2.2 Work in the Classroom and Further Activities

Materials: Wood as a renewable resource. (Urban areas are dependent on a rural environment for this resource.)

Wood used in homes for	How and where to get wood	Consequences of taking wood	What to do about the consequences
Lumber furniture paper products	Forests, cut trees ...	erosion animals move out people lose recreation area	plant new tree recycle paper manage forests more carefully

- Let children draw a plan of an imaginary street which reflects their observations and desires.
- Playground: Let the students walk the distances from their homes to the nearest playground; list the distances. Make a list of items that the children find or wish to find on the different playgrounds:

Playground	Items to be found	What students wish to find
...	...	...
...	...	...

- Draw conclusions and if necessary take the following actions with your students:

  Find out the person(s) responsible for the playgrounds. Invite him/her to your class or let the students write him/her a letter in which they describe what they have found out about playgrounds and about their own needs.

6.3. Sample Activity 3: Bristol City Town Trail (Bristol, GB)

Now walk to the end of Guinea Street and out into Redcliffe Hill.

Use the map to show you where to *STOP, LOOK and LISTEN.*

Write six words that describe what it is like at A and B.

A

B

Spot the Shops

Shopping in Redcliffe Hill

Are there any shops here that surprise you? Are there any other shops that you would expect to find in a parade of shops like this?

List three everyday things that you would not be able to find here

Do you think that the people living in the flats round here would be able to do most of their weekly shopping in these shops?

Tracker's Notes

6.4 Extended Studies and Activities

As shown in the above examples, the extended activities may or may not cling to the initial subject matter from the trail (e.g. Housing). The environmental aspect is so broad that it might be useful to examine the dependence of a community from its surrounding region, the nation, or the world. To make your choice without being drowned in the abundance of materials, we have selected a few books which facilitate the further development of teaching units related to problems in urban settings:

Allman, S.A., Kopp, O.W., and Zufelt, D. L.: Environmental Education, Guidelines and activities for teachers. - Merril Publishing Co., Columbus (1976).

This book stresses the interdisciplinary approach in environmental education. A large number of concepts is listed and expanded information and student encounters given to all of them. You will find nine concepts regarding problems of the city.

Hungerford, H. R., Litherland, R. A., Peyton, R. B., and Tomera, A. N.: Investigation and Action Skills for Environmental Problem Solving. Modules I-VI. A curriculum development project designed to promote autonomous problem solving in environmental education. Stipes Publishing Co., Champaign, Ill. (1978).

While not directly related to the topic of Urban Trail, this book might help teachers as well as students to develop action skills once an urgent problem area has been identified.

Instructional Objectives Exchange (IOX): Environmental Education, Grades 4-9. IOX, Los Angeles (1974).

This book contains a collection of objectives from numerous curricula under three main categories: Natural ecosystem - Human environment - Environmental problems. General objectives as well as sample items about the urban environment can be found in the second category.

Stapp, W. B., Cox, D. A.: Environmental Education Activities Manual. Vol. I-VI. D. A. Cox, 32493 Shady Ridge, Farmington Hills, MI 48018 (1975).

This six volume set provides developmental K-12 experiences as well as a philosophy and extended resource materials. You will find elaborated activities for all the aspects of your local trail which you consider worth pursuing.

Tanner, R. T.: Ecology, Environment, and Education. Professional Educators Publ., Inc., Lincoln, Nebraska (1974).

Without going into specific details the author reviews several programs that have been prepared for urban environmental education.

CHAPTER 7 - APPENDIX

7.1 Defined Terms

Urban Trail (Town Trail): Urban Trails are means to discover the total urban environment (natural, man-made, and social) by using the concept of urban 'streetwork' - parallel to rural field-work - at selected sites along a prepared walking route. This concept of environmental education "leads the teacher to ask questions and evaluate experiences without having the answers fed to him." (Martin and Wheeler, 1975)

Community Studies: A part of the school curriculum which, directly or indirectly uses the 'total community,' including the built (e.g. planned) environment, as the resource for learning. These studies are not the field of any particular traditional discipline, but rather are multidisciplinary.

Linear/grid/satellite/vertical city:

The linear city consists of a transportation corridor several miles in length lined with shops, theaters, offices, and light and medium industries. Behind the corridor on one side would be a band of medium industrial and commercial business and heavy industries. On the other side of the corridor a similar band would contain houses and apartments.

The grid city consists of a number of centers surrounded by residential areas. Each center contains some of the major shops, offices, businesses, and entertainments that are generally found in a downtown district.

The satellite city consists of a central city which functions as the main business, commercial, and entertainment unit. Surrounding it and separated by open space are medium sized satellite cities consisting of smaller businesses, shops, offices, some residential units, and of residential areas plus everyday shopping facilities.

The vertical city consists of large buildings which contain shops, businesses, homes, industries, and recreation and entertainment facilities.

7.2 Extended Bibliography

Martin, G. C., and Wheeler, K.: Insights Into Environmental Education. Oliver and Boyd, Edinburgh, GB (1975).

Contains several basic articles about studies in an urban environment.

Ward, C. and Fyson, A.: Streetwork. The exploding school. Routledge and Kegan Paul, London and Boston (1973).

The 'bible' for the teacher who opens his classroom to the school surroundings and its community; contains encouraging help for the teacher facing the problem of starting with 'streetwork'. Despite the fact that the book is written for an English audience the main ideas should be easily transferable to U.S. situations.

Wheeler, K. S. and Waites, B.: How to Make a Town Trail. Bulletin of Environmental Education (BEE, London) Nos. 16-17, August-September (1972).

A short article which highlights general principles of a town trail and helps to conceptualize the ideas of streetwork.

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